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LAND ECONOMICS

a quarterly journal of

PLANNING, HOUSING & PUBLIC UTILITIES

Reflections on Rural Economic Development ..... FRANK R. BRAY

Effect of Anti-Discrimination Legislation upon the FHA- and VA-Insured Housing Market in New York State ..... ROBERT C. WEAVER

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The Non-Residential Population of the Central Business District ..... HARRY SHARP

"WHATEVER MAY BE THE LIMITATIONS WHICH TRAMMEL INQUIRY ELSEWHERE WE BELIEVE THE GREAT STATE UNIVERSITY OF WISCONSIN SHOULD EVER ENCOURAGE THAT CONTINUAL AND FEARLESS SIFTING AND WINNOWING BY WHICH ALONE THE TRUTH CAN BE FOUND."

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Reflections on Rural Economic Development

By FRANK R. BRAY*

". . . . *For a prosperous civilization . . . . the central factor is commerce. . . .*" (A. N. Whitehead).

Recent work in the theory and practice of economic development in underdeveloped areas frames its approach in general or analytical terms, in terms of rather mystifying programs of industrialization, in abstract high level planning, and in disembodied concepts of investment and of training in production techniques. Prominent are programs of sweeping institutional changes such as land reform and the elimination of the money lender or middleman.[1]

More realistically, development in rural areas comes through the readiness and ability of a people, organized in their respective communities to try new methods of production and distribution, and to adapt the experience, the products, and the markets of other regions to their requirements.[2] This development requires the growth of commerce and of a connected pattern of rural marketing and servicing centers. It means the growth of an economic structure comprizing farms and farmers grouped around a complex of villages, larger centers and towns, linking the farm community to markets, providing skilled services of various types and forming the structure for that economic flow which it is the merit of tables of inter-industry and inter-area transactions to illustrate clearly. Nor is the structure complete until other regions and other countries are considered.

As with wage-earners, so with the farming community: the real incomes that they may anticipate are an attribute not only of the productive equipment, skill and energy with which they work but also of the social and economic structure to which they belong.

The thesis that, where rural centers are absent or underdeveloped and where the greater part of the population works on the land, economic development is low may be confirmed by observation, or taken as a matter of definition. The limiting case occurs in those marginal areas where, perhaps because of low fertility or primitive techniques, farms do not have precise limits and hunting, nomadic

* Rangoon, India.

[1] Cf., S. H. Frankel, *The Economic Impact on Underdeveloped Societies, Essays on International Investment and Social Change* (Oxford: Basil Blackwell, 1953).

[2] Cf., William Dampier (*Voyages and Discoveries*, first edition, 1699) quoted by Raymond Firth, *Elements of Social Organisation*, The Josiah Mason Lectures delivered at the University of Birmingham (London: Watts & Co., 1951), p. 92.

grazing, or shifting cultivation is practised without leading to a permanent pattern of settled communities. Economic development is high where rural centers are well developed and a minority work on the land.

In general, the level of township development reflects the value of rural commerce, modified by variations in the levels of savings and expenditure within a district.

Where regard is had to wise land use and to providing maximum opportunities of access to land, the level of commerce and of economic development will have at its base the number of farms of a determined level of income that can be established;[3] this number both determining and being determined by the complex of towns, each town acting on, and reacting to, the others that come into being.

The pattern emerging in this case will differ from that emerging where landholdings do not conform to the ideal of an economic size, where the incomes gained in a district are to a large extent spent elsewhere and where the wealth of agriculture flows into the hands of a wealthy elite. In that case a relatively small number of populous urban centers will be surrounded by a large number of semi-isolated rural villages, as in the dualistic economy of Asia.

Given the level of incomes and expenditure in a district the precise limits and nature of development will vary according to (1) topography; (2) the ease of communications; (3) the nature of farm expenditure and of local product processing facilities as influenced by the type of farming; (4) the area and structure of holdings, reflecting agrarian policy and the economies of scale; (5) the distribution of farm population; (6) the nature of farm storage facilities; and (7) the demand for day or seasonal labor. With these factors known, so also, in general, (since a high level of community development ensures against demographic pressures and accidental hazards) is the advantage of having periodic redistribution of land, or scattered or consolidated holdings; of having communal land or of living in village communities or on the farm enterprise. Finally, the opportunities for shopkeepers, office workers, and tradesmen and their arrangement of farm estates, or in villages, shopping centers, marketing and distributing towns emerges from this basic structure. Several of these factors influence the extent to which township facilities are gathered in a small number of towns or spread over many.

A concentration of farm population provides a cluster of buyers about a town and will increase its ability to offer delivery services economically. Efficiency of communications determines the degree of competition that a town has to face from other towns. Thus both a concentration of buyers and ease of communications favor the development of the more efficient, economically-developed town which ensures a wider, more homogeneous market for purchase and sale.

Conversely, if produce is carried by horse or mule over rough ground, normal trade will not be undertaken over large distances unless justified by the presence of highly valued, perishable products. For ordinary trade, markets must be close to or on the farm. In this case, as in that where the poverty and lack of purchasing power which limits storage capacity compels small and frequent buying of urgent needs, township facilities will be dispersed, markets small in extent, and economically-underdeveloped centers (found normally only in areas of high

[3] Colin Clark, "Land Settlement in Queensland," Evidence to the Royal Commission on Pastoral Lands Settlement (Queensland), *Economic News*, Queensland Bureau of Industry, Brisbane, Nos. 7-8, July-August, 1950.

population density) numerous in relation to more highly developed towns.

In planning new settlements it is particularly important to ensure that levels of production, commerce, and expenditure within a district will suffice, the district being large enough, to support a complex of towns and a level of services which the type of farming to be established requires for successful operation.

An important implication of the interdependence between town and country, recognized clearly by Adam Smith but often overlooked in a more highly industrialized age,[4] is that, unless economic development is already unbalanced, the introduction of people into an area requires a program of community development outside as well as on the farms. The necessity for a balanced development justifies selective migration and is a reason for the attention that has been paid to planning group settlements in various countries.

Are there exceptions to the general rule?

Sometimes land yields are confused with the level of economic development. While the very highest yields consistently maintained are associated with the intensive farming and efficient management of advanced areas, land use can also be intensive in economically underdeveloped areas with low living standards. Such is the situation in many densely settled peasant communities where the farm population buys and sells little, where rural villages and communications are not highly developed, where few people are engaged in specialized occupations and where villages and small centers concerned in the local exchange of farm products are numerous compared with rural centers that form the basis for inter-area trade.

But neither should the average level of individual incomes be the sole guide to the level of economic development. Where land is abundant and cheap, large incomes for landowners or operators may be derived from the selective operation of large holdings at a low level of returns per acre. The products of this type of farming should be able to bear the costs of transport in the absence of a complicated local network of rural marketing and processing facilities. Pastoral farming, particularly wool production, is suited to such an environment.

But such farming creates an economic structure that makes the farm population dependent on a few main centers. At best, where living standards are high, it deprives the resident part of the population of many of the contacts and amenities of civilized living. At worst, where the workers' living standards are low, it may expose them to payment and advances in kind, forced sales to the landlord and the extortionate prices of the company store.

With the low level of economic development the landlord may be obliged to market his tenants' produce and the farmer to obtain his requirements in varying degrees; by bulk purchases from main centers, so that the farm performs some of the functions performed in other regions by wholesalers and retailers; by providing various production and consumption needs on the farm so that some of the advantages of division of labor are foregone; by absenteeism or long absences from the farm; and by the education of his children outside the district. Estate farming organized precisely to meet deficiencies in area development excepted, absence of financial

[4] *Wealth of Nations* edition (London: G. Bell & Sons, 1921 Vol. I) esp. pages 386, 411 and 421. Gibbon often uses the same assumption of interdependence.

agencies and safe avenues for investment entices capital away from the district.[5]

High economic development in farming areas requires rather large continuous areas of moderately intensive settlement accompanied by high labor productivity and good average incomes, promoting the growth of towns that are not merely or for the most part a collection of agricultural operators or workers but contain an extensive diversity of skills complementary to agriculture. Such conditions are found in Western Europe, North America, New Zealand and in parts of Australia and the Argentine.

Stages in the Development of Rural Centers

At the lowest levels of economic development, sufficient produce must be stored by producers to meet the needs of the group until the following harvest.[6] In that case village centers exist primarily for external security, internal order, social, ceremonial and religious purposes. The limited needs of the individual are met by means of close co-operation with other members of the group in the use of land and labor.

Narrow markets of limited variety, lack of communications and the dependence of the individual on the collectivity to which he belongs, the traditions of that collectivity providing the guarantees of its survival, do limit geographical mobility and the possibilities of exploiting land resources. Wide variations in population pressure are typical of the less developed areas of the world.[7]

In primitive communities trade does not call for a settled class of traders forming a village or town. Intermittent, perhaps silent trade and training expeditions between groups following traditional routes, are characteristic.

But as the level of commerce increases the primitive social order is inevitably altered and producers come to barter their products at the traditional fair. Often women are the traders. By degrees there emerges a separate class of persons whose major occupation is trade. Itinerant or resident European traders are developments in this direction.

The next step is distinguished by the appearance of shopkeepers with premises, however humble, who gradually disengage themselves from the marketplace. Indeed typical features of the underdeveloped village are small transactions and a plethora of traders, small shopkeepers and artisans who come crowding in to absorb every available area of "economic space." The shops, though they may sell their stock in direct exchange against the products of the region, may also make to order, give credit, and use money as an accounting and exchange medium.

A feature of the village economy of the non-industrial world which uses money as a means of exchange externally and barter for the most part internally,[8] is precisely that of a mixture of shops and village fairs. Village trade is directed, even enforced, by a land tenure, taxation and money-lending system designed to extract small agricultural and labor surpluses from the predominantly subsistence farmers, and to draw these surpluses onto the national market by means of contractual or traditional labor obligations, low remuneration, peonage, debt, an uneven distribution of lands, forced sales to the

[5] *United Nations*, Economic Commission for Latin America and the Food and Agriculture Organization, *Analysis of Some Factors which act as an Obstacle to the Increase of Agricultural Production*, E/CN.12/306 of April 8, 1953, p. 3 and pp. 71-72.

[6] B. Malinowski, *Coral Gardens and their Magic* (London: George Allen and Unwin Ltd., 1935), Vol. I.

[7] International Labour Office, *Agricultural Wages and Incomes of Primary Producers*, Report IV, Asian Regional Conference, Nuwara Eliya, Geneva, 1949, pp. 8-12; India, Famine Enquiry Commission, *Final Report* (Delhi: Madras Government Press, 1945), pp. 78-79; E. H. Jacoby, *Agrarian Unrest in South East Asia* (New York: Columbia University Press, 1949), pp. 138-142.

[8] United Nations, *Preliminary Report on the World Social Situation* (New-York: Department of Social Affairs, 1952), pp. 164-165.

money lender (or deliveries to the state), rack rents, or usurious rates of interest.

So far, the wholesale and retail functions have remained confused and combined. An important stage in economic progress is their separation. Thereafter as the commercial activity of a population center grows it ceases to be concerned only, or indeed mainly with the exchange of products and services in a passive sense and not only provides an expanding market for agricultural production but actively stimulates productive efficiency in the use of land and labor. A larger agricultural surplus is made available for exchange.

The novelty of experience arising out of commerce suggests new methods of production[9] while commerce and regional specialization facilitate capital formation and make the adoption of capitalistic methods materially possible. Adam Smith recorded as a further benefit of the growth of towns the extension of good government.

The change in the function of towns as they grow economically is made obvious by comparing the constitution of the rural commercial center with the small rural village. The latter is mainly concerned with supplying day-to-day food, accommodation, clothing and household needs and, in addition, with offering opportunities of religious worship, schooling and ordered social life. The former in advanced areas handle many farm production requirements; for example quality seeds, fertilizers and farm machinery. They provide production, and not only relief credit, and legal and accountancy services. Their mechanics, farm contractors, construction and building enterprizes form part of the mechanism of agricultural production.

The highly developed farm economy means construction and maintenance services for road or rail transport, for water supply, electric current and telephone communications. It means agricultural training and extension services, farm produce inspectors and land valuers, working to established standards and grades. The rural centers providing these services make possible and encourage a high degree of specialization in farm production. They encourage and make possible the disposal of land in regular or rectangular, contiguous, identifiable lots of an economic size with clear, easily-searched ownership or leasehold titles that are secure and easily transferred. They make increasingly easy and safe the investment of capital in land improvements by the registration of mortgages and the development of an organized market in land transactions at prices and on conditions that function to determine land use and labor returns in farming.

Availability of these services breaks down those social and economic obstacles that prevent the realization of an integrated labor market and of an optimum distribution of labor. The developed rural structure of some advanced areas makes available living conditions, employment and educational opportunities that are not significantly inferior to those offered the urban population.

Current practice shows that farm statistics are best collected, income, wage, price and production policies and controls best applied, equitable income and land taxation, labor protection, employment service, social security, land tenure and tenancy legislation best administered through a central organization effectively connected by communications and population centers with each region and district of the administration. Optimum and equimarginal returns on cap-

[9] A. N. Whitehead, *Adventures of Ideas*, Pelican Books A 103 (Harmondsworth, England: Penguin Books Ltd., 1948), p. 105.

ital investments are unlikely without these economic lines of communication.

Developed rural centers, or a complex of such centers, not only provide many production services for farmers; they market, store, and process standardized products at low cost in bulk in that orderly manner which avoids great seasonal price variations—and seem to do so with increasing efficiency as they grow in size and economic importance.

Such centers provide an increasing variety of specialized services catering to the consumption needs, both material and cultural, of the surrounding community. They provide educational, health, and other personal services, entertainment and such incentive, and indirectly-productive goods as radios, periodicals and books, electrical equipment and household furnishings. They facilitate the organization of political, social and occupational groupings.

The rural town is the focal point through which the ideas and products of other regions can be made to serve the needs of its hinterland. It is the means whereby the district is freed from its own limitations in natural resources, labor skills and markets, whereby soil and climatic influences may be modified, disadvantages turned into advantages, permanent settlement be maintained, holdings consolidated without injustice or an increase in farm risks, and more uniform living standards obtained in the district it serves.

The degree of farm efficiency and the speed with which improvements in the economics or techniques of production or marketing are adopted, or taken advantage of, reflects the sensitivity of the farm population to ideas coming from outside the farm. This sensitivity in isolated village communities is very low. In advanced communities it is much higher in some areas than others. It is highest close to towns. The closer the contacts between town and farm the quicker are farmers to adopt new methods.[10]

It is a function of the rural town to digest and modify new farming ideas so that they become practicable in the district it serves. It provides the material means enabling the ideas to be adopted and the products resulting therefrom to be exchanged.

If the services the developed rural town or rural structure provides (in realizing high levels of labor productivity) are absent as they are in underdeveloped areas it is idle to expect great changes in levels of living simply by sending experts to point out better ways of farming; while experience in Bolivia, Indonesia and Venezuela shows that the investment of large sums of money in the development of mineral resources or in plantations will not automatically act as a stimulus to widely based indigenous economic growth.[11]

To expect poor communities to absorb far-reaching changes on the farm, or to better their conditions rapidly from such changes without having the complicated marketing, organizational, and investigational services of advanced communities, is to expect poor and ignorant farmers to imitate progress which enlightened farmers in advanced communities can achieve only with the help of a developed structure of township facilities, requiring for that development much capital and an appropriate distribution of workers amongst different employments in commerce, construction, maintenance, processing, and so on. Any improve-

[10] Lauren Soth, *How Farm People Learn New Methods*, National Planning Association Agriculture Committee on National Policy. NPA Planning Pamphlets No. 79, Washington, October 1952, p. 12.

[11] Leon A. Mears, "Private Foreign Investment and Economic Development, Venezuela, Saudi Arabia and Puerto Rico," *Inter-American Economic Affairs*, Summer 1953. pp. 3-20. H. H. Boeke and Frankel hold similar views.

ment in agricultural efficiency and rural commerce calls for increased town and village development.

Land Settlement in the New World

The progress of colonization in countries of recent settlement displays the processes of agricultural development. In several cases an initial basis for develment was provided by the presence of an indigenous population which, in Mexico and Inca South America, possessed a social and economic structure with settled patterns of farming which the conquerors from feudal Spain found familiar. In other cases slaves were forced to bear the brunt of the deprivations of land settlement in underdeveloped areas. Settlement was advanced with pioneer crops and products highly prized on world markets that justified the rapid investment of capital in area development. Gold, wool, rubber, cotton and coffee were such products.

The unpriced abundant land of pioneer areas was suddenly brought into economic contact with the west by improving communications. Cheap land policies and extensive holdings enjoying the economies of size and providing in rudimentary form the administration, division of labor, co-operation, processing facilities, bulk marketing structure and amenities necessary for permanent settlement, were characteristic features of pioneer commercial farming.

Abundant land was the guarantee of economic security to pioneer communities, and a more highly developed commerce the substitute for traditional membership of a more self-contained group in the satisfaction of varied human needs. In the case of rapidly developing intensive settlements, shopkeeper and the artisan could be farmers as well until they found greater specialization profitable with growing population and commerce.

Where land was cheap, where it was clear of forest growth, or easily cleared, where water supply was adequate and drainage efficient, where natural fertility was high, the climate temperate and weed growth controllable, and where there were no serious obstacles to communications, settlement proceeded apace and was accompanied by the rapid development of frontier communities, or by the mining of soil fertility. Governments anticipating increased public revenue, by land grants, the control of land sales and leases, homestead acts, improvement, residence and aggregation clauses attempted to direct the rate and course of settlement by influencing the terms on which land was available. Land companies acted similarly.

These attempts did not always meet with the desirable results. In Australia and New Zealand, Wakefield, recognizing the importance of an organic type of settlement, in the first stages of colonization tried to produce the elements of English rural society and to prevent land aggregation by setting a price on land that would have excluded workers from land ownership but that would have been sufficient to assist in paying expenses of migration and of area development. Marx commented bitterly.[12]

The attempt failed. Land availability for all is a more secure basis for pioneer settlement and, in this case, the large commercial holdings taken up by squatters outside the area of the planned colonization diverted the stream of migration. To succeed, the small holdings of the planned settlements would have required a complementary appropriately developed structure of diversified local markets and villages to which they could have sold and by which they could have satisfied their needs. In the absence of

[12] *Capital* (London: George Allen and Unwin Ltd., 1928), chapter 25.

such a structure the small holdings could support only a subsistence type of farming and land sales were not sufficiently rapid to meet current commitments on overhead costs.

Wakefield's timing was premature for, at a later date, with improving communications and markets, the monopolization of lands by those who had acquired vast areas cheaply prevented closer settlement and the further development of rural communities providing low cost distribution and other services for family-sized farms.

Henry George was occupied with this aspect and phase of settlement—the flow of settlers into an area of freely available virgin land providing the basis for further division of labor, for improving living standards, and for the growth of population centers.[13] Large holdings, land speculators, and in other cases feudal type holdings, sometimes held up development and progress.[14]

Not only the price and availability of land but also the arrangement of holdings was important. In parts of the United States town sites were the nucleus around which farm settlements were laid out. In older countries the grouping and rearrangement of holdings has sometimes made it possible for a community to obtain better access to the goods, services and experiences originating outside the farm, such as those offered by church, school, shops, post-office and cinema.[15]

In the earlier phases of more intensive settlement emigrants moved away from overcrowded, poor living conditions. Low standards of living and absence of township facilities did not deter them and pioneer family farming was a life of hardship, privation, and constant brutal toil.

The period of rapid extension of European farming over the wild lands was one during which the rise of an industrial wage earning class, divorced from the land, provided expanding markets for farm products of variable quality, grown without conscious regard to grading, style, sanitation, or the refined tastes associated with high incomes. In turn, the supplies of cheap food and raw materials from the new world assisted the industrialization of the old.

The rapid expansion in quantitative demand made minimal demands on capital investment in land development and labor skills. By vastly enlarging the possibilities of earning incomes from the land made newly accessible it permitted a rapid increase in the number of farms and farm workers, eased those monopolistic pressures which in less favorable circumstances restrict entry to a career on the land or elsewhere[16] and facilitated the investment of capital in the development of a marketing structure of communities linking the pioneer areas with the urban centers of consumption.

Insistence on family farming and enforcement of residence clauses as settlement proceeded beyond the initial stages ensured that, in the most important countries of settlement, the benefits of the growing demand and of the abundant land went to *bona fide* settlers and not to speculators and to absentee landlords more interested in urban than in rural development.

Rural Migration in Relation to the Economic Structure

(A) *Settlement Prospects.* Land development and settlement was not an easy,

[13] Henry George, *Progress and Poverty* (London: Henry George Foundation of Great Britain, 1931), pp. 164-170, 189-190 et seq.

[14] The conflicts between large landowners and small settlers are well described by George W. Hill, Gregoria Beltran and Cristino Marino, "Social Welfare and Land Tenure in the Agrarian Reform Program of Venezuela," *Land Economics*, University of Wisconsin, Madison, Wisconsin, February 1952, pp. 17-29.

[15] Cf. the description in the London *Times* June 3, 1953, of land reform at Gaudiano, Italy.

[16] Cf., Lloyd H. Fisher, "The Harvest Labor Market in California," *The Quarterly Journal of Economics*, Harvard University, November 1951, pp. 482-487.

automatic process nor the result merely of decisions taken within the limits of the individual farm. Government direction and planning were at every stage conspicuous and, despite favoring circumstances and the provision of government credit, colonization involved hardship and heavy toll. Some of the factors favorable to rapid land development have disappeared. Countries which have become accustomed to higher living standards will not permit a lowering of those standards within their frontiers. The nineteenth century rate of expansion of a low-quality working-class demand and the supply of cheap, fertile, and accessible land have been arrested.

Land used extensively in areas of low rural development is being depleted in soil fertility and that available for settlement is generally of inferior quality or is in tropical or badly administered areas where improper care, lack of maintenance, and the absence of an informed, critical public opinion, and of skilled organizations capable of co-ordinating programs of public investment, seems to allow a curious waste of scarce capital resources.

On any large scale, clearing the land, providing access, draining, controlling water supply, pests, weeds and tropical disease, and research to ensure the maintenance of soil fertility may be calculated, jointly or severally, to involve a high cost per acre that increases the need and reduces the possibility of financing area development. Even should population pressure be relieved elsewhere it may be stated as a general rule that only broad access to processing facilities and remunerative markets, a sufficiently high level of commerce, an appropriate marketing structure and skillful energetic farmers can ensure living standards, a type of diet, and returns on investment including administrative expenditure, justifying settlement, and permitting necessary adaptions.[17]

Technical advances and improving living standards in the advanced countries[18] have, since the days of pioneer settlement, formed a demand for products requiring an increasing amount of skill in production, the development of agricultural training programs, which are of uniform quality ready for use by processing industries or are of the high standard suitable for use by servicing trades, such as hotels and restaurants.[19]

It is not easy for underdeveloped areas to cater to this demand, and there is a social aspect to marketability which favors those producers who belong to, or who have had long experience in advanced communities. They will find it easier to formulate and respond to the needs of industry and of consumers in developed countries and to maintain contacts with distributing outlets. A feature of the plantation system is foreign direction which well knows, and is in close contact with the needs of the industrial areas to which it exports.

(B) *Permanent and Seasonal Migration.* Increasingly the advantages lie with areas having a developed structure of population centers and communications and where migration of rural labor is directed towards the money and wage economy of the more intensively developed or developing rural areas and to the towns in those areas where levels of

[17] For the consequences of failure to emerge from a largely self-contained agriculture in a European Settlement in South America see: Wayne D. Rasmussen "Colonial Tovar," reprint from *Agricultural History*, July 1943, pp. 156-166.

[18] United Nations, *World Economic Report 1949-50* (New York: Department of Economic Affairs, 1951), p. 10.

[19] P. T. Bauer and B. S. Yamey, "Economic Progress and Occupational Distribution," *The Economic Journal*, London, Vol. LXI, No. 244, December 1951; Margeurite C. Burk, "Distribution of the Food Supplies of the United States," *Agricultural Economic Research*, Bureau of Agricultural Economics, U.S.D.A., Vol. IV, No. 3, Washington, July 1952, pp. 83-87.

production and the proportion of urban to rural population are relatively high.

Noteworthy is the migration from the less densely settled northeastern areas of Brazil to the states of Sao Paulo and Rio de Janeiro, where even the highly organized coffee *fazendas* have in recent years been losing labor to more intensive forms of farm settlements or to the towns. From Bolivia labor has migrated in great numbers to northern Argentina. In Peru the sierra Indian migrates in a constant annual stream to seek employment in the developing coastal towns and plantations. At this moment there should hardly be need to mention the migration of Mexican workers over the border into the United States. In Africa tribal subsistence agriculture is being abandoned for wage-paid employment in commercial agriculture and in towns.

In Europe, Australia, and New Zealand, and probably in other areas, the drift towards the towns is often deplored and such attempts as have been made to reverse this drift have called for large-scale efforts to promote overall agricultural development involving an expansion in the administrative and economic services provided by rural towns. Housing construction, expanded government services, the building of schools and hospitals, land development, rural electrification and irrigation are the more obvious reflections of the kind of economic development that is needed; and there is no reason to believe that such development would halt the increase in the urban percentage of the total population. Indeed the first impact of the planning and investment will be felt in the main centers and will spread throughout the economy from there. So costly is such development that neither Australia nor the Argentine has been able to realize immigration aspirations owing to the strain on capital resources.

It has, from this point of view, been easier and less costly to attract hired farm workers from other less developed countries than to promote land settlement. It has not been easy to prevent the immigrants from joining the main stream of labor movement towards the more highly developed areas and the more preferred occupations.

In the case of labor shortages immigrant-hired workers help to support an already prepared social and economic framework. Free from the difficulties of land development and farm management they do not compete for land but rather, by filling gaps in the less preferred occupations, make possible a fuller use of material and organizational resources.

The extreme case is seasonal labor, found not only in the Americas and Africa, but also to a limited extent in Europe, which makes little or no demand on existing community facilities, is not assimilated to the standards of the farm community in which it works; makes few or no calls on housing, education, health, public transportation, social insurance, employment, placement and labor protection services where such exist; is too often exploited by shopkeepers and recruiting agents by means of advances of money, high prices and commissions; and its upbringing, training and cost of subsistence when unemployed is borne by its own meagre resources or by the poor communities from which it comes.

(C) *Group Settlements.* Particularly in Australia and New Zealand, where the accumulation of a part of export receipts in government-stabilization accounts and their use for the overall benefit of the branch of farm industry concerned represents an interesting development,[20] the basic elements of rural economic growth have been provided by the appropriate

[20] Reserve Bank of New Zealand, *Bulletin*, Wellington, May 1953, p. 70.

public authorities. But, in some other parts of the world, private organizations supplying capital needed for development have with government sanction and with a greater or lesser degree of government assistance sought to provide, in an integrated community comprising both central services and individual farms, a mechanism of production, marketing and living facilities appropriate to the needs of their members. These settlements, which are sometimes obliged to include a proportion of national residents, are found more particularly in countries possessing idle land and a shortage of farm products, but not possessing an agrarian structure of towns and farms capable of rearing enterprizing national workers, of broad economic horizons versed in modern methods of commercial agriculture, nor of providing settlers with suitable employment opportunities.[21]

Group settlements aspire at once and as a result of central direction to establish services and take decisions which, in other cases, are the preoccupation of individual business or government activities that over a period of time come to form an important part of the rural economic development and township structure of the district. The importance of the services rendered by such individual or government services can be illustrated by considering the decisions which intimately affect the success of a settlement. Such decisions are those regarding the pattern of settlement and the arrangement of farm holdings, rural villages and market towns; the price to be paid for land; access; land development; land survey and registration, land use, farm layout, shape and size of holdings; measures to prevent excessive subdivision or fragmentation of holdings; the provision of capital and the investment of this capital; the elaboration of tenure arrangements, of production methods and of a profitable pattern of crop and livestock production; the proper time to change this pattern if and as relative prices of products change; the organization of processing and marketing procedures, of educational and farm training courses; the part to be played by cooperation; the allocation of management responsibilities; the provision of advisory and supervisory services; and the demand for the use and the payment of labor.

It might be going too far to say that all such decisions should be the result of community participation. Yet the farming community should evolve village organizations to express needs and implement decisions. Maximum community participation is a reasonable and prudent goal.[22] Certain difficulties regarding such decisions have characteristically arisen, particularly in establishing group settlements. They differ from estate farming in lacking a completely centralized direction of operations. Establishing preconceived standards for the settlement limits that freedom in choice and adaptation that is a conspicuous feature of "unplanned" pioneering. Overcapitalization of land, high costs of making land fit for settlement, payments for the development of communications that have little relation to the prospective increase in incomes and returns from land sales, and the insufficient size of individual holdings are often regarded as primary causes of the failure of new settlements.[23]

No doubt, it is tempting to try for too high a level of refinements in early

[21] A. de K. Frampton, "Land Tenure in Relation to the British West Indies," *Caribbean Economic Review*, Vol. IV, Nos. 1 and 2, Caribbean Commission, December 1952, pp. 136-137

[22] C. W. Beer, "The Social and Administrative Effects of Large Scale Planned Agricultural Development," *Journal of African Administration*, Vol. V, No. 3, London, July 1953.

[23] Working Paper prepared by the Food and Agriculture Organization concerning Land Settlement, submitted to the Preliminary Migration Conference of the International Labour Organization, April-May 1950, pp. 22-24.

stages,[24] and to cover expenses by an excessive subdivision that loses the advantages in the use of capital, administrative overhead, labor and land, that is possible on a larger holding. But similarly, unforeseen variability in untried crops, and livestock diseases, soil depletion, lack of suitable equipment, of credit and working capital, labor troubles, and a wrong balance in labor skills, and lack of training facilities appropriate to the needs of an isolated and developing community, have at different times upset expectations.

Education presents difficulties for group settlements. Where schools are already available in rural areas they are generally inferior to city schools,[25] and to the schools to which the group settlers are accustomed. Lack of rural education hinders the assimilation of the settlement to the national culture; and may encourage the settlers to create their own advisory services where this is unnecessary or inadvisable.

Problems of assimilation can indeed be overcome only when a settlement or people is connected with the national economy by a network of principal and satellite towns ensuring to members a satisfactory level of life, opportunities of leadership and full participation in the life of the country with a two-way flow of labor between farm and town. The ultimate success of a group settlement can only be consummated by loss of identity.

A new settlement encounters difficulties since it acts without the benefit of those established township services which have registered the totality of past experience in present principles of conduct. In older areas the costs of land development, the pattern of production, the labor requirements and returns to be expected in different types of farming, and in different areas, the arrangement of holdings, credit risks, and so on, are determined by practical experience and registered in the specialized knowledge of government officers, business men, teachers and advisers serving the farm community. The developed rural structure will provide the elements of public administration, metereological, educational and informational services, public utilities, business services, trades, communications, access to markets, capital and credit, assisting selected farmers to evolve a satisfactory balance in the production of different products and a satisfactory intensity in the use of labor, power, equipment, fixtures, materials, seeds and livestock of various types, design or layout. Appropriate methods of work and timing of operations will be part of the fund of community experience. If economic disturbances occur the resources of the community will be mobilized to meet them and as changes become necessary the community facilities will assist in carrying them out rapidly and with a minimum of discomfort to the farming community.

And if levels of production are high it may not matter that the costs of maintaining public health and costs of production are also high. On the other hand, low costs of production and high levels of physical output may be insufficient without low costs of distribution and access to markets. Thus, finally land settlement aspects cannot be treated apart from the economic structure of the settlement as a whole.

Conclusions

In dealing with the problems and processes of rural economic development this article has necessarily touched on some general aspects of development—on

[24] *Ibid.*, pp. 11-12.

[25] United Nations, *Preliminary Report on the World Social Situation*, Department of Social Affairs, New York, 1952, pp. 71-72.

commerce, economic specialization and employment structure. It has had to recognize that high living standards reflect membership of a highly differentiated social group that does not admit new members indiscriminately.

Economic progress is not the automatic result of impersonal allocations of capital and technical knowledge nor of any indiscriminate transfer of labor from agriculture to other occupations; it is the result of capital and technical knowledge diligently created, absorbed, directed and co-ordinated by enterprising members of living, orderly communities, organized internally for the selection, assignment and carrying out of work tasks; these communities providing, or enabling producers to enjoy, a widening circle of exchange economically and culturally, and making possible the benefits derived from regional and other forms of specialization.

If the almost subsistence economy is neglected, then at the lower end of the scale is the local village economy, as in Asia where two-thirds or more of the population is engaged in agriculture and where average per capita incomes are certainly less than $100 per annum. At the other end, once the barriers to expanding markets have been removed, real incomes may show rapid year-to-year progress due to improving industrial as well as agricultural productivity. But to move from the lower to the higher level will involve a thoroughgoing reorganization of rural life, and movement from one stage to another will depend on the rate of such reorganization which, except in very special circumstances, is not likely to be rapid.

General economic development requires a balanced growth of commercial towns, marketing centers, shopping centers and local villages; not the lop-sided development of large cities on the one hand and the underdeveloped semi-isolated village on the other. The village betterment schemes of India and Turkey may be taken as a conscious or unconscious recognition of this need for balanced development; while the kolhoz of Russia suggest a similarity, in purpose and organization, with the plantation system of colonial territories.

The changing importance of different types of centers reflects not only structural changes in the economy and cyclical fluctuations in prosperity, but in turn influences the economic health of a country. In the most rapidly developing countries, where attitudes and economic structure are most favorable to increasing productivity[26] and where mechanization has been releasing land from the need for supporting draft animals, rapidly rising living standards have increased the demand for the technical training and research facilities provided by towns in maintaining improving labor productivity and a high uniform quality of production.

Thus while Russia, Japan, India and now China show that heavy industry can be promoted, though not altogether satisfactorily, on a structure of towns historically the result of a landlord system and of wide agricultural areas of low labor productivity, economic development, of which industrialization is more often a consequence than a cause, springs most naturally from a prosperous agriculture. The exchange of agricultural surpluses creates trading centers which in turn become the means of stimulating an increasing efficiency in agriculture. On the basis of commercial centers providing wide markets and a concentrated diversified supply of labor skills, manufacturing activities may de-

[26] Cf., L. D. Stamp, *Our Undeveloped World* (London: Faber and Faber, 1953), pp. 70, 104, and pp. 178-182.

velop spontaneously, in turn making their influence felt throughout the economy.

This being so, is it any wonder that there is an increasing gap in living standards among countries? Nor is it any wonder that underdeveloped countries, lacking the necessary marketing structure, find that depreciating exchange rates do not stimulate the production and exportation of traditional or more particularly additional products in a way that might be expected.

So while the work of experts must be largely an attempt to foresee and promote, with the necessary safeguards, whatever—in the sense of Toynbee—are the most promising and the most probable detailed lines of development, such work should be considered as a variation on the major theme of promoting a redistribution of labor and a connected network of developing population centers in the interests of the industrialization, or more strictly the commercialization of the underdeveloped areas. Is not commerce the secondary, and manufacturing the tertiary industry?

It is to achieve development in this direction that assistance programs should be aimed, by the exchange of information and ideas, by the loan of experts, by land reform, by appropriate selective migration, by easing trade restrictions, by improving access to developed, discriminating markets, by measures to increase the demand for labor and raise incomes in the less developed areas, so increasing the demand for rather carelessly-produced agricultural commodities.

Great responsibilities rest with the advanced areas. They may not only be called upon for aid and grants during many years, but should endeavor to understand the needs of the underdeveloped areas; to aid these areas when required in formulating policies; undertake to provide, against payment or through loans, needed goods and services; and adapt their own marketing structure in the interests of development, just as a town does for its surrounding countryside.

Lastly, it may be timely to add that the collapse of a production and marketing structure in formerly colonial territories does not always mean an unfitness to govern. For a while export production may fall and, through a redistribution of incomes, consumption may rise; but both tendencies represent an increase in freedom and a movement towards a structure that the people can govern, and this surely is the basis on which to build, with understanding, future economic development.

The Effect of Anti-Discrimination Legislation Upon the FHA- and VA- Insured Housing Market in New York State

By ROBERT C. WEAVER*

I

NEW YORK STATE has passed the Metcalf-Baker Law banning racial discrimination in FHA- and VA- insured construction where multiple dwelling units or projects of 10 or more units are involved.[1] A somewhat similar bill has passed the State Assembly and is now before the Senate in New Jersey.[2] Connecticut is in the process of accomplishing the same goal through an interpretation of the state's Civil Rights Commission which has included government-insured housing within the definition of publicly-assisted housing.[3]

This extension of non-discrimination legislation is significant both regionally and nationally. It has already aroused serious forebodings on the part of builders and other segments of the real estate industry many, if not most of whom assume that it will be a catastrophe.[4] Since, however, any and all proposed changes in racial patterns seem to inspire similar fears and forebodings,[5] it may be useful to inquire into the dimensions and nature of the problem which the Metcalf-Baker Law has created in the State of New York.

II

Until the turn of the century, the presence of a few Negro families in any particular neighborhood was accepted without comment in many American cities. Little thought was given to adverse effects upon property values. When the rapid influx of large numbers of low-income families of varied ethnic backgrounds into urban areas occurred at the same time that the supply of low-cost housing failed to grow commensurately, the resulting slums, blight and social decay were associated with the newcomer and identified with him when he was of a darker hue.[6] Equally important, but not unrelated, was the rise of suburbs and their newly created sales-point of exclusiveness.

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[1] The Metcalf-Baker Law actually extends the definition of publicly-assisted housing accommodations to include FHA- and VA-insured housing of the type described above. The Wicks-Austin Act, passed in 1950, spells out unlawful discriminatory practices in publicly-assisted housing and provides that aggrieved persons have right of action in any court of appropriate jurisdiction for restraint of such violation or other equitable remedies. In addition, any person so aggrieved has the right of action in any court of appropriate jurisdiction for damages caused by such violation. (L 1950—C 287)

[2] Assembly No. 543: An Act to amend the "Law Against Discrimination" approved April 16, 1945. (P.L. 1954—C 169).

[3] Connecticut has also amended its Civil Rights Law, granting the Civil Rights Commission authority to initiate complaints "wherever it has reason to believe that [the law banning racial discrimination] has been or is being violated in any public housing project or publicly-assisted housing." Connecticut House Bill No. 1004.

[4] "What Builders are Doing about Minority Housing . . . . and What Problems They Face," *House and Home*, April 1955, p. 138.

[5] Nor has housing been an exception. When Stuyvesant Town was being planned and constructed a question was raised relative to Negro occupancy in the vast new development. Public officials issued pious phrases expressing a hope for racially democratic patterns, but the owner observed, "Negroes and whites don't mix. A hundred years from now, maybe they will." (Charles Abrams, *Forbidden Neighbors* (New York: Harper and Bros., 1955), pp. 252-53). Accordingly, Stuyvesant Town excluded non-whites and its sponsor, the Metropolitan Life Insurance Co., provided somewhat comparable facilities for Negroes in Harlem's Riverton development. A decade of protests, court action and local legislation ensued, culminating in the acceptance of a few colored tenants at Stuyvesant Town. (*Ibid.*, p. 265) Today, the twenty Negro families resident in the development are hardly noticed; and nobody talks of Negroes' and and whites' mixing.

[6] Robert C. Weaver, *The Negro Ghetto* (New York: Harcourt Brace & Co., 1948) Part I.

In the development of current attitudes toward non-white neighbors there were and are two basic factors: rapid introduction of large numbers of minority-group families and the possibility of escape from minorities through the purchase of a new home in a "restricted neighborhood." Restriction of this type was made respectable and desirable by well-organized and carefully-nurtured sales promotion;[7] until a few years ago it had the official stamp of approval since FHA accepted and furthered industry's approach to the matter.[8] And in our democratic society where there is general belief in the existence of widespread social and economic mobility,[9] exclusiveness in residential areas found ready acceptance; few families on the way up could afford to go against the current. Then, too, respected and widely disseminated real estate economics coupled racial (and often income) homogeneity with stability of values about the same time that racially-mixed areas became associated with slums and low-cost housing. There was every reason for the average white family to consider Negroes and other non-whites undesirable neighbors; the real estate industry, in all its branches, had made them forbidden neighbors.

Given this institutional setting, the basic fears of the building industry are understandable. Indeed, it would be unrealistic to expect an industry which had grown for two generations on the basis of championing and expanding residential segregation to greet a proposal for its partial eradication with anything less than apprehension and resistance. And it could cite supporting evidence.

"Open occupancy" and "interracial" housing in New York and elsewhere has usually been *de facto* non-white housing.[10] When an occasional FHA-insured project of this type has been announced and constructed, the Negro demand has been so great as to fill the project or indicate the probability of large-scale colored-occupancy. In the latter situation, whites have preferred to buy elsewhere and the project has "gone Negro." If the non-white market was significant, as in the New York City area, the developer has suffered no financial loss and often made a larger than normal profit due to the possibilities of charging higher prices than the more competitive white market would absorb. Where the non-white market was more restricted, as in parts of upstate, failure of whites to enter the project might mean vacancies and losses to developers.

As long as most new construction is closed to the non-white purchaser, there is always the possibility that he and others similarly discriminated against will gravitate to the few projects which will accept him.[11] At the same time the doubtful white purchaser is being wooed by many other developers who are emphasizing,

[7] Abrams, *Forbidden Neighbors*, Chs. XII, XIII and XIV; Weaver, *op. cit.*, Ch. XII.

[8] Weaver, *op. cit.*, pp. 217-22; Abrams, *op. cit.*, pp. 229-37.

[9] Although it was once assumed that social and economic mobility was much greater in this country than in Europe, recent research has challenged this concept. However, there is "belief in the existence of widespread social mobility" [in the United States]. Seymour Martin Lipset and Reinhard Bendix, "Ideological Equalitarianism and Social Mobility in the United States," *Transactions of the Second World Congress of Sociology*, Vol. II, p. 38 (Reprint No. 76, Institute of Industrial Relations, University of California)

[10] Thus in the New York City newspapers, advertisements of open occupancy or inter-racial housing in Queens, Long Island or Westchester County are, in effect, a polite way of announcing a project for non-whites.

[11] This is, of course, almost sure to happen when the new housing is in the heart of an area of non-white concentration. Thus the announcement of 211 apartments, renting for $40 per room per month in Harlem, occasioned over 4,500 applications some 10 months before completion date. (*The New York Times*, August 12, 1955). The article stated the interest of the sponsor (Bowery Savings Bank) to house people of all racial groups in the new development. It was, however, an open secret that few whites had applied for housing in the new building. And, to date, there is no analysis of the rent-paying ability of the large number of non-white applicants. Subsequent discussion of the non-white effective demand for FHA- and VA-insured housing will suggest tha this large figure indicates a demand which, in most instancest is not effective in light of earnings and FHA requirements,

urging and offering racial exclusiveness. Such a setting creates a concentrated non-white demand at the occasional open occupancy project and accentuates avoidance of open occupancy developments on the part of white families.

The Metcalf-Baker Law recognizes and is designed to meet these difficulties which plague the individual developer of open occupancy housing.[12] Because it affects all builders who enjoy certain governmental assistance, enforcement of this legislation should accomplish two important objectives: (1) disperse non-white demand over *all* developments of the prescribed type and (2) eliminate the possibility of escape from one such development by finding racial exclusiveness in others of the same category.

This has several important implications. The fear of wide-spread inundation of FHA- and VA-insured projects seems unwarranted *unless* the building industry materially reduces the volume of such construction, or scares away white purchasers by establishing early patterns of all-colored occupancy. Although some have suggested that the new law will sound the death knell of construction financed by government-insured loans, sober reflection casts serious doubts on such an eventuality. As *House and Home* recently observed, "the industry's ability to sell the million-plus new homes a year that means prosperity hinges on the low down-payments made possible by FHA and VA. Abandoning them is so unthinkable it is not even discussed."[13]

In the final analysis the effect of this new legislation upon the FHA and VA housing market will be determined by the extent of immediate effective demand of non-whites for this type of construction, the distribution of this demand among projects affected by the law, and the reactions of white neighbors to non-white residents in such volume and occupancy patterns as may result. Fortunately, there are fairly reliable income-data for non-whites in the state of New York. In addition, it is possible to estimate roughly how large a proportion of the families financially able to move into new FHA and VA developments are ready to do so. Since the basic non-discrimination legislation covering publicly-assisted housing (the Wicks-Austin Act) has been in effect for five years, there is a body of experience indicating how non-whites will probably distribute themselves as a result of the Metcalf-Baker Law and the extent of litigation resulting from non-discrimination legislation governing publicly-assisted housing. Finally, there is available material indicating various reactions to, and results of, the movement of non-whites into neighborhoods of varying economic ranges.

III

In 1950, there were 210,000 non-white households in New York State; estimates for July 1955 put the number at 236,000. Since 90 percent of these were in the New York City Metropolitan Area and another 5 percent in the Buffalo Metropolitan Area, it is obvious that the demand of non-whites for FHA- and VA-insured housing is largely concentrated in and about these two cities.

On the basis of estimated 1953-1954 family incomes made by the New York State Housing Rent Commission,[14] only 18.6 percent of non-white families in New York City had annual incomes of $5,000 or more after federal income taxes

[12] For a discussion of the problems facing an individual developer of open occupancy housing, see "Interracial Subdivision," *House and Home*, April 1955, pp. 151, et seq. For the individual pioneer in this field there is no escaping the conclusion that the problems are "formidable enough to suggest that few builders elsewhere are likely to tackle open occupancy subdivisions now." *Ibid.* p. 186.

[13] "Open Occupancy," *House and Home, op. cit.*, p. 148.

[14] *Income and Ability to Pay for Housing Nonwhite Families in New York State*, New York State Temporary Housing Rent Commission, August 1955.

were deducted.[15] Applying the FHA definition of effective income, which excludes about 80 percent of all secondary incomes (usually in the form of earnings of a second wage earner), the proportion falls to 8.3 percent.[16] Only 13.1 percent of the non-white families in Buffalo had incomes of $5,000 or over in 1955.[17]

In order to estimate ability to pay for housing expenses, the experience of the FHA has been drawn upon and its standards applied in computing the potential rent-paying and home-buying capacity of non-white families.[18] The maximum number of non-white families able to pay for FHA- and VA- insured housing carrying a mortgage of $9,600 or more in the the New York Metropolitan Area would be about 14,230 on the basis of estimated 1955 population distribution[19]. For the Buffalo Metropolitan Area the maximum would be about 550 families.[20] In the New York City Metropolitan Area, about 12.5 percent of the non-white families could afford a gross monthly rental of $100 and over.[21] This would involve some 26,550 families; the comparable figure for the Buffalo Metropolitan Area would be about 1,132 families.[22]

Because of several circumstances, the number of non-white families in New York theoretically able to pay for new housing is much greater than the immediate effective demand. The following factors are significant in this regard:

(1) Most of the higher income non-white families are professional and business people. Some of them, for political or business reasons cannot or do not want to move to the suburbs.

(2) Some of the higher income non-white families are already living in suburban areas where they are well housed; others own attractive homes in Manhattan, Brooklyn, Queens and the Bronx. Most of these households do not contemplate moving.

(3) A large segment of non-white families able to pay for FHA and VA rental housing are either now living in existing standard housing or are planning to move to new developments underway in Harlem or other localities within the city limits.[23] In this connection, it must be recalled that there is *some* good and desirable housing in Negro-occupied areas and more is planned or under construction.

(4) Most non-white families able to afford FHA and VA housing are currently paying much less for rent than the minimum requirements of new construction.[24] Many so housed have commitments and budget patterns which are adjusted to their present level of spending for shelter. While they and others are potential purchasers or renters of new FHA- and VA- insured housing, a large proportion will not, for economic reasons, be immediately in the market.

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[15] *Ibid.*, Table I.

[16] *Ibid.*, Table II. Basically this is somewhat misleading since secondary income appears to be somewhat more stable among non-whites than among whites.

[17] These data are obtained from the Census survey of Buffalo in March-April 1955. (*Ibid.*, Table III.)

[18] *Ibid.*, p. 5. Since about 95% of non-white families in New York City are tenants and generally subject to rent control, present rental payments shed little light on economic ability to pay for FHA- and VA-insured shelter.

[19] *Ibid.*, Table V. This includes only families of two or more persons, allows for cost of heat and utilities and is based on incomes after payment of federal income taxes at 1954 rates. FHA-mortgage credit requirements result in the exclusion of about 80 percent of all secondary incomes. According to estimates of housing expenditures set forth in the recent Study of the New York State Temporary Housing Rent Commission, a family with $100 monthly housing expenses can afford a $9,600 mortgage at 5 percent or a $10,800 mortgage at 4½ percent if the mortgage is for a 25-year period. For 30-year mortgages comparable figures are $11,150 at 5% and $11,850 at 4½%. (*Ibid.*, Table VIII.)

[20] *Ibid.*, Table VII.

[21] *Ibid.*, Table IV. It should be observed that the potential demands for sale and rental housing are *not* mutually exclusive. The difference in the two figures is due to the inclusion of all secondary income in the case of demand for rental housing.

[22] *Ibid.*, Table VI.

[23] In addition to the Bowery Savings Bank's development, there are several thousand units of Title I housing presently underway in Harlem. Two other Title developments are located on the fringes of Harlem, and non-whites will occupy some units in Title I projects outside Harlem. Analysis of the Title I program in New York City indicates that some 2,773 dwelling units will be constructed in Harlem and 3,960 on the fringes of Harlem. These projects should house from 3,500 to 4,000 Negro families. In addition, several hundred Negro families will probably move into other Title I projects in Manhattan.

[24] It must be recognized that, while non-whites pay more for less housing as a general rule, higher-income non-whites usually, because of limitations upon availability of better facilities, pay a lesser proportion of their income than whites for housing.

Although it is impossible to make an estimate of the immediate effective demand of non-whites for new construction, one can safely assert that it will involve but a fraction of those whose incomes nominally would permit them to purchase or rent such housing.[25] Since the latter number is small, it is conceivable that the total number of non-whites actively and effectively in this market at the present could, if spread out over a large volume of construction, be absorbed without involving appreciable numbers in any one project.

IV

The fact that so-called open occupancy, FHA- and VA- insured projects have, in the past, been inundated by non-whites is not a valid basis for assuming a similar eventuality under the Metcalf-Baker Law. Formerly, the non-white home seeker had no choice in the matter since most FHA and VA construction was not available to him. Now all will be open. How non-whites will respond to the new situation is best demonstrated by their distribution in that segment of publicly-assisted housing in which racial discrimination has long been banned. Because of rentals and income limitations, non-whites have participated widely in public housing projects in all New York cities where they reside. In spite of non-whites' widespread occupancy and the existence of non-discriminatory legislation for over a decade, projects far removed from established Negro neighborhoods have only sparse non-white occupancy.

Even in New York City, where the demand of non-whites for housing is so large and where over a third of those in public housing are Negroes, the greatest concentration of Negroes is in projects built on sites within established non-white ghettoes; the next highest concentration is in sites contiguous to established ghettoes; the lowest concentration is in projects furthest removed from established centers of non-white residences. Since most of the vacant sites are located in outlying areas, there is a similar correlation between vacant sites and low concentration of Negro occupancy.

In addition to subsidized public housing which has counterparts in all sections of the Nation, the New York City Housing Authority operates a no-cash subsidy program where apartment rents average about $71.00 per month and maximum income of families at time of admission was $5,400. There are 20 completed projects of this type offering accommodations to about 22,000 families.[26] One, Colonial Park Houses, is situated in upper Harlem and almost all its tenants are colored; more than half the tenants of a second Manhattan development on the fringe of Harlem are Negro; the two remaining projects in Manhattan have about 25 percent Negro occupancy. Of the no-cash subsidy developments outside Manhattan, five have Negro occupancy of less than 10 percent; six have from 10 to 15 percent; and five have from 15 to 20 percent.

In limited dividend housing under the supervision of the State Division of Housing, the degree of non-white participation has been negligible. This is due in part to the fact that, in contrast to the public housing program, past enforcement of non-discriminatory legislation has been diffident. It is due chiefly, however, to two circumstances: the extent of non-white effective demand for such housing has been far less than for

[25] The situation will, of course, change in time. As new patterns are established and more opportunities for participation develop, a larger number of non-whites will enter FHA- and VA-insured housing. For this to come to pass there must be rather radical changes in spending habits, widespread realization of new opportunities for housing and the concomitant passage of time.

[26] *Project Statistics*, December 1954, New York City Housing Authority.

public housing and, more significantly, these projects have been developed on vacant sites, none of which is close to existing concentrations of non-whites. Similarly, in Queensview, a cooperative housing development just across the Triborough Bridge from Manhattan's Harlem, there is only a handful of Negro occupants. This is a project of 726 units requiring $600-per-room down payment and costing $17.00 per room per month. Despite a genuine desire on the part of its sponsors to recruit Negro occupants, only 15 or 20 colored families moved in some five years ago. Today about the same number reside there. Yet the widely publicized announcement of a non-discriminatory policy has not complicated filling the project and maintaining a large waiting list of white applicants.

These experiences, when considered in light of the growing volume of middle income housing which will soon be available to non-whites in Manhattan, lead to the inescapable conclusion that there will be no general inundation of FHA- and VA-insured projects covered by the Metcalf-Baker Law. Much of the pent-up effective demand for this price shelter will be absorbed in Manhattan and inlying areas in the other boroughs. As the incipient trend toward development of moderate- and medium-rental housing in Harlem continues, and more Title I housing open to non-whites is produced in Manhattan and surrounding areas, the immediate effective demand of non-whites for FHA and VA construction elsewhere will be proportionately reduced.

Although relief from racial discrimination in a limited dividend project could be secured through a court injunction or be the occasion of damage suits, there is no record of any such action. The number of families eligible economically for FHA- and VA-insured housing will be appreciably less than for limited dividend rental developments. And unless the building industry evidences an inclination to violate the spirit as well as the words of the new law, there is no reason to anticipate widespread resort to the courts incident to the administration of the Metcalf-Baker Law.

V

It has been noted above that the Metcalf-Baker Law removes the assured "escape" from minority-group families which has been a trade mark of new FHA- and VA-insured housing. Realization of this fact will, in itself, render futile the selection of any one development of this type as a means of entering an assured lily-white neighborhood. It will also mean that racial exclusiveness as a sales appeal will be both illegal and dishonest. These facts alone will have a marked effect upon the attitude of whites to the presence of a few Negro neighbors.

There are, however, additional developments which have pertinence. First, we are learning that the building industry has often over-estimated the opposition of whites to a few non-white neighbors of similar economic and social backgrounds. Second, there are successful examples of racial integration in New York and other states which suggest that neighborhood reaction to colored occupants is either changing or different from what has been assumed. Third, whites are beginning to resist appeals for panic sales at the advent of the first colored purchaser and, finally, research is documenting the fact that there is no one universal relationship between race and property values.

Builders, financial institutions and real estate dealers are generally convinced of the color consciousness in their market. Yet there is some evidence which chal-

lenges their conclusion.[27] Levittown in Long Island has been a symbol of suburbia's racial exclusiveness; nevertheless it has recently absorbed a few Negro owners without confusion. In the early 1950's no other single issue aroused so much guilt and dissension among its residents as racial discrimination against Negroes. Although those living in Levittown hadn't created the pattern of exclusion, they sustained it. Most of them agreed, however, that, had Negroes been in the project from the first, there would have been no problem. As one put it, "I'll admit that it wouldn't have made a damn bit of difference to me originally."[28] Apparently, it doesn't make too much, if any, difference to the neighbors who continue to live next door to the eight or ten colored owners now in Levittown.

There are desirable, middle-class neighborhoods throughout the state of New York and elsewhere which will be surprised to learn that Negro occupancy is supposed to depress property values. In these residential communities a few Negroes have been and are accepted without comment. So stable are these neighborhoods that they have not even become the subject of social scientists' research?[29]

Also, the emergence of a small but growing number of middle-income Negro families during and since the war and repudiation of judicial enforcement of racial covenants have occasioned their buying higher-priced homes. This has led to the movement of non-whites into many new areas some of which are most desirable. In Detroit, for example, there are several areas where Negroes with high incomes have bought expensive property and where, both because of location and selling price, the chances of non-white inundation seem remote for the present.[30] Similarly in Washington, D. C., by 1950 there were in the exclusive sections of Northwest Washington, blocks with from two to eight non-white families in areas where before 1940 few, if any, non-whites had resided. Most of this housing was located in blocks where the average value of one-dwelling unit structures was between $15,000 and $25,000.[31] Elsewhere in urban areas a similar trend is appearing:

> In the last few years, ... new factors have entered the situation which are changing . . . . [the] pattern of 'invasion and succession.' One factor is the change in attitude toward living near members of a minority group. Partly as a result of an organized effort to reduce prejudice and discrimination, and partly as a result of the housing shortage, more people are 'willing' to live next door to members of minorities than was formerly the case. The second new factor is a Supreme Court decision of 1948 which removed the legally enforceable basis of the restrictive covenant, which has hitherto been the most powerful legal device used to prevent members of the minority groups from buying or renting in majority group areas. Since 1948, in most Northern cities and some Southern cities as

[27] A survey of white reaction to new non-white neighbors in the Bay Area of California was conducted recently by Davis McEntire, a professor at the University of California. The study indicates that white neighbors are accepting minority groups without fuss or bother. In 35 neighborhoods of varying income-group composition, where a few non-whites had recently moved, there was no particular antagonism to the new neighbors. Those interviewed lived either next door or across the street from non-white families, yet one-quarter of those questioned didn't even know there were Negroes or other minority families near by. (This survey was summarized in the December 3, 1954 issue of *The New York Times*, and summarized in the April 1955 issue of *House and Home*, p. 194).

[28] Harry Henderson, "Rugged American Collectivism; The Mass Produced Suburbs, Part II," *Harper's Magazine*, December 1953, p. 85.

[29] One such area has recently come to the writer's attention. It is located in White Plains on the Saxon Word Road leading to Scarsdale. Here six Negro families of low incomes have lived for a hundred years. Yet the area is typified by estates. Recently the area has begun to be subdivided and whites have built homes of the type which FHA insures. At the present, two additional Negroes are building $40,000 to $50,000 homes in the area and whites continue to build and live in the community.

[30] These conclusions are drawn from an analysis of the Census for Block Statistics (*1950 United States Census of Housing, Detroit, Michigan, Block Statistics*).

[31] *1950 United States Census of Housing*, Washington, D. C. *Block Statistics*.

well, Negroes have been moving into many white neighborhoods which under the old system would have taken them decades to penetrate, if ever they could have gotten in at all. There are now a large number of otherwise white neighborhoods into which one or two Negro families have moved. Mixed housing seems to be becoming the dominant pattern in at least the northern cities.[32]

Although most new areas entered by non-whites in recent years have been in the older sections of our cities, some are located in fairly exclusive suburbs. One such community is in Southwest Westchester County. It is the Pinecrest Area of Hastings on the Hudson, about eight miles from the city limits of Yonkers. This is a community of about 45 families living in houses valued from $20,000 to $45,000. At present, there are seven Negro residents although as many as eight colored owners have been in the area during the past five years. Since the advent of non-white occupants, three houses in the community have been sold to white purchasers—one by a Negro. The colored residents are doctors, business men and college professors. In an adjoining area of somewhat lower-priced homes, four or five houses in the $17,500 range have recently been built by, or sold to whites. Colored residents participate rather fully in community affairs, and the present president of the Pinecrest Civic Association is a Negro. Whites who have recently moved into the area report, however, that white realtors often had to be pressured into showing them the property they ultimately purchased.[33]

Evidence is also trickling in which suggests that middle-class whites are no longer giving up their desirable homes at the first cry of "the Negroes are coming and you'd better bail out while bailing's good." Two years ago colored purchasers began buying in northeastern Teaneck, New Jersey—a community of less than 400 homes, valued at from $13,000 to $28,000 and adjoining the established Negro district of Englewood. Recently real estate agents began importuning white owners to sell, declaring that the fifty-seven resident Negro families would attract others, inundate the area with non-whites and destroy property values. But not all the white residents responded. Last summer about a third of them signed an agreement not to sell. Simultaneously the Urban League stated that it "wants to see an integrated neighborhood. We do not want to see a new all-Negro segregated area and we believe that property values will remain high and unaffected if white and Negro families now living here can become fully integrated."[34]

Two contiguous areas in New Rochelle —Rochelle Heights and Rochelle Park— are also planning to meet a similar situation. While the number and proportion of non-white occupants are less than in northeastern Teaneck, there was fear, apprehension and varying degrees of panic, followed by an initial rush of a few to put their homes up for sale. Then a reaction set in and some careful thought

[32] Arnold M. Rose, Frank J. Atelsek and Lawrence R. McDonald, "Neighborhood Reactions to Isolated Negro Residents: An Alternative to Invasion and Succession," *American Sociological Review*, October 1953, p. 499.

[33] This is a familiar and oft repeated pattern of behavior. In Syracuse, for example, the Friends Housing Committee recently released a survey of Negro families living outside the established area of non-white concentration. Among the significant findings are the following: "In view of this very high degree of community acceptance, the reader may wonder why more of Syracuse's higher-income Negro population has not moved out of the central part of the city. One reason, of course, is the very real difficulty encountered by a Negro in trying to find a home in a desirable neighborhood through a realtor or through a builder (practically impossible in the latter case, though the new Metcalf-Baker law gives hope in this regard). . . . Finally, perhaps this study suggests that the greatest opposition to integration stems not from the average citizen but from the 'gatekeepers'—the realtors and builders, who *think* that the neighborhood will be less oriented toward a democratic housing pattern than it really is." (*Survey of Negro Families Living Outside 15th Ward Area in Syracuse, N. Y. and Surrounding Areas*, Friends Housing Committee, July 1955).

[34] "Negroes Greeted in Teaneck Area," *The New York Times*, July 3, 1955.

was given to the matter. It was discovered that the new Negro owners were improving and beautifying their properties to the benefit of the neighborhood. Even more startling was the discovery that the Negro residents, too, didn't want an all-Negro community and joined the older residents in encouraging new purchases by white families. [35]

Today these areas are working toward the objective of maintaining a racially-mixed pattern. The biggest stumbling blocks to achieving this goal are the almost solid reluctance of white real estate brokers to show homes for sale to prospective white buyers and the ever-present possibility of recurrence of panic selling, often inspired by Negro as well as white real estate operators. Even with the opposition from real estate operators, it has been possible to make sales to new white purchasers in these areas of racially-mixed housing.[36] In both Teaneck and New Rochelle, as in all new suburban areas, it is possible to control over-occupancy and associated undesirable property uses through occupancy standards and similar restrictions. This circumstance removes the greatest threat to a neighborhood incident to the entrance of a shelter-starved, minority group.

In older sections of the city it has been a familiar pattern for non-white occupancy of a formerly middle-class white area to be typified by bad property uses, overcrowding and physical decay.[37] But where occupancy standards require single-family occupancy of single family homes, prohibit cutting dwellings up into smaller units, and restrict undesirable additions, the market is limited, for the most part, to those who can afford to maintain the property and use it according to the standards for which it was designed. Thus in San Antonio, Texas, where Negro incomes are much lower than in New York State, colored families have rapidly moved into the 200 unit Eastlane Addition which was created in 1949 as an all white project of $5,800 to $8,500 bungalows. Despite the fact that the development is directly east of the City's main Negro housing district, the rapid entrance of non-whites has not changed the occupancy pattern save in the color composition of residents. As *House and Home* reports:

> The original white owners—civil service workers, policemen, railroad men, skilled labor— have now been largely supplanted by Negro civil service workers, ministers, railway postal clerks and skilled labor. Typically, most wives also work. Farm and Home Savings and Loan Association, which made many of the original loans, still holds many of the loans. Farm and Home's L. A. Lawlor says the mortgage payment record of the new owners has been as good as in any similar white area. And nobody, driving down the street, can tell which homes are white-occupied and which are not. Except for one thing: for sale signs.[38]

This experience is in striking contrast to the resentment and threat of violence in a lower middle-class neighborhood in Philadelphia when a low-income Negro purchased and moved into a house in the area. In this instance the Negro buyer was not economically able to restore or maintain his property, nor were occupancy standards applicable. His entrance did represent a threat to property values. Only alert action by the City's Commission on Human Relations and financial and other assistance from the Friends and Negro citizens have been able to stem mass flight of white residents. For-sale signs have disappeared and, during the past six months, one real estate dealer alone has sold 26 houses in the area, all of them to relatives or friends

[35] *Report of the Housing Committee*, Council for Unity of New Rochelle, Inc., 50 Weyman Avenue, New Rochelle, N. Y.
[36] *Ibid.*
[37] Weaver, *The Negro Ghetto*, Chs., VII and XV.
[38] "Open Occupancy," *House and Home*, op. cit., p. 149.

of the old time settlers. Values haven't dropped and the community has settled down to its old tranquility.[39]

On the other hand, the existence of for sale signs in the San Antonio suburb is inevitable. It reflects non-white inundation of a new source of relatively low-cost housing contiguous or close by an existing ghetto. Had the area not been protected by adequate restrictions on use, in all probability Negro occupancy might have been accompanied by drastic changes in income level and occupancy patterns. All of these cases suggest that in adequately-zoned, medium-priced developments removed from areas of non-white concentration and where white owners resist appeals or urges for panic sales, interracial patterns can be stabilized.[40]

In every discussion of non-white occupancy there is explicit or implicit reference to resulting fall in property values. We have much to learn about this relationship. Perhaps the new study of the Fund for the Republic, devoted to the housing of non-white families, will shed light on the subject. Increasingly, recognized appraisers and real estate economists are accepting the dictum expressed by Oscar J. Stern in *The Review of the Society of Residential Appraisers*: "It is a fact, the axiom that colored infiltration collapses the market is no longer true."[41] As a leading trade journal of the building industry observed: "In recent years, more and more experts have put forth studies debunking the once widely-held notion that property values slide in transition neighborhoods. Now evidence is accumulating that some city neighborhoods—at least in the North—are ready to accept immigrant Negroes without fuss."[42]

VI

What then will be the effect of the new legislation? Clearly, it will not, in and by itself, solve the housing problem of non-whites. It will not even meet the needs of the vast majority of middle- and higher-income minority group families seeking better housing in the state of New York. Nor should its enforcement disrupt or seriously affect the FHA- and VA-insured housing market in the state. Still its impact will be appreciable; for it will not operate in a vacuum.

To a limited degree the new legislation will add directly to the supply of

[39] Hannah Lees, "How Philadelphia Stopped a Race Riot," *The Reporter*, June 2, 1955, p. 26-28. There are, however, other areas in Philadelphia where Negroes have recently moved into middle-class neighborhoods without fuss. "A survey of area bounded by Ellet Street, Wissahickon Avenue, Johnson Street and the Pennsylvania Railroad, in which there are approximately 1,000 houses, reveals that only 80 houses have changed hands in the past year. Fifty-two of these were sold to white buyers, 26 to Negroes, one to a Chinese-American and one is undetermined. The same survey indicates that nearly all the new buyers are business and professional people. This includes some white buyers who have moved into racially-mixed blocks from choice and some who bought the homes which they had been renting for some years. Realty values have held up. The physical appearance of the neighborhood has been maintained at the same high standard." *Report of Church Community Relations Council of Pelham*, Pihiladelphia, Pa,.

[40] "A study of two neighborhoods in which the Negro population increased substantially since 1940 showed that whether the change was for the better or worse depended on many factors. One neighborhood, an eight-block section of the Temple Redevelopment area . . . was characterized in 1940 by poor housing, a great deal of conversion of old, single-family homes to apartments, few owner-occupied dwellings and low incomes among the residents. In this neighborhood the quality of housing deteriorated further as the Negro population increased during the next ten years. Another neighborhood, the 'Nicetown' area (is in Germantown) . . . Here the houses were in fairly good condition. Between 1940 and 1950 when the Negro population in this section almost tripled and home ownership increased, there was a 57% drop in the number of substandard homes." *The Housing of Negro Philadelphians*, Commission on Human Relations, Philadelphia, Pa.

[41] Oscar J. Stern, "Long Range Effect of Colored Occupancy," *The Review of the Society of Residential Appraisers*, January 1946, p. 6.

[42] "Minority Housing," *House and Home*, *op. cit.*, p. 194. The study of racial residential patterns of Minneapolis cited above comes to a similar conclusion relative to acceptability of non-white neighbors. "The evidence of this survey of eight neighborhoods of Minneapolis where a single Negro family lives in an otherwise white neighborhood indicates that there is a tendency to accept or to accommodate to the Negro as a neighbor. . . . Insofar as the limited data of this survey of Minneapolis can be generalized, if the residential pattern of northern cities takes the form of a scattering of Negro families living in predominantly white areas, the prognosis is that this would tend to increase the acceptance and accommodation of Negroes by whites." Rose, Atelsek and McDonald, *op. cit.*, pp. 506-7.

medium-priced shelter available to non-whites. At the same time, it should accelerate acceptance of colored families elsewhere in existing medium-priced housing both inside and beyond the city limits. From both of these trends, there should emerge additional experiences of successful inter-racial housing. The fact that such case histories emanate from the former citadels of racial exclusion will have repercussions throughout the housing market. No longer will racially-mixed housing be associated only with slums and public housing projects.

Basically, therefore, the effect of the law will be to facilitate new patterns of racial occupancy. Reluctance of non-whites to move in large numbers into developments far removed from existing areas of concentration and builders' preference for outlying sites will combine in easing the impact as well as enforcement of the Metcalf-Baker Law. As new patterns are established and accepted by occupants, the industry should slowly modify its fears of and concern with non-white occupancy. While this is occurring, new urban renewal projects and expanding programs of state-aided limited dividend housing will absorb a much larger segment of the non-white demand for medium-rental units, since they too are required by law not to discriminate. Concurrently, non-whites' reluctance to venture into what have been hostile areas will decrease. Conceivably, a gradually growing effective demand for new suburban dwellings on the part of minorities should coincide with an increasing acceptance of such families by the develers and occupants of suburban areas.

An evolutionary process toward inter-racial living is possible although, as in any instance of social change, there will be problems. Economics, population movements and response of whites to the slow infiltration of minorities are all on the side of success. Profit-motivated builders, too, have a real interest in achieving such results although established patterns of behavior will, of course, be impediments to an easy transition. But this change is being initiated at a time when the climate in the United States is favorable; for there is growing evidence that new patterns and attitudes in intergroup relations are flowering in housing as in other aspects of American life.

Innovation, Competition, and Locational Changes in the Pulp and Paper Industry: 1880-1950†

By HELEN HUNTER*

I—*The Problem*

PAPER, which consists of a mat of wet fibers pressed together and dried, can be made from many different fibrous raw materials. In principle, the basic process used today is similar to the methods of a hundred years ago. There have, however, been major changes in technique which have made it possible to employ previously unused fibers, and there have been significant changes in the economic availability of these fibers. Wood pulp was introduced as a raw material in 1880. This completely altered the basic geographical relationship between production factors and markets for a large part of the paper industry causing a major change in its economic optimum location pattern. After 1910, additional changes in technology, and in the regional availability of pulpwood (the trees from which wood pulp is made), modified still further the optimum pattern.

This study investigates the way in which the paper and pulp industries responded to these developments. Common sense would lead one to expect some sluggishness in changes in patterns of industrial location. Mistaken entrepreneurial decisions about the choice of plant sites are to be expected, especially in the early stages of development of an industry, before what have been called the "economies of experience"[1] are realized. The personal preferences of entrepreneurs about the part of the country in which they want to live, the weight of tradition, and many other factors may cause an isolated firm to be misplaced. Writers on location theory usually assume, however, that the force of competition will—in the long run—bring the industry as a whole to conform to its optimum economic location pattern. In the words of Hoover:

> ". . . . the location patterns of industries are by no means so haphazard or so sluggish in adjustment to differential advantage as the locations of individual firms. Competition, in so far as it prevails, will reward and encourage well-located enterprises and shorten the lives of poorly located ones. Even if new establishments were to be located purely by guesswork or whim or by sticking pins into a map at random, and if they were never relocated, some semblance of a reasonable pattern would still emerge as a result of competition."[2]

The historical material which follows is presented in order to determine the extent to which the forces of competition did bring about the locational adjustment of the pulp and paper industries and to work out the particular factors which slowed down or accelerated the adjustment process. How strong was competition? If change came slowly, or not at at all, was it because of weakness of competition or because of other factors inherent in the technology or organization of the industry? What role was played by tariffs and other forms of government influence?

The development of both the wood pulp industry and those branches of the paper industry which make use of wood

† This study is based on material collected for the writer's doctoral dissertation: *United States International Trade in Wood Pulp: A Case Study in International Trade* (Radcliffe College, 1952). Two copies are on deposit in Widener Library at Harvard University. Hereafter, this will be referred to as *Dissertation*.

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[1] Kenneth Galbraith, *American Capitalism, the Concept of Countervailing Power*, Cambridge, Mass.: Houghton Mifflin, 1952, p. 37.

[2] Edgar M. Hoover, *The Location of Economic Activity*, (New York: McGraw-Hill, 1948, p. 9).

pulp is covered here. This complicates the historical narrative somewhat, but it has seemed necessary because the two industries were interdependent.

A good subtitle for this study might be: "How long is the long run?" If it is very long, then, as Keynes said, we shall all be dead before it arrives. In the final section of this study, some consideration is given to the way in which the interests of the economy as a whole may have been affected by the course of events in the pulp and paper industry. In particular, public policy—the tariff on paper and pulp and the extent to which domestic competition was discouraged or fostered—is briefly reviewed.

II—*The First Impact of the Introduction of Wood Pulp*

Since wood pulp was not consumed in important amounts until the late 1880's, the Census of 1880[3] presents a picture of the final development of the paper industry before the wood pulp era. Three main facts stand out. First, the industry consisted of a large number of small plants.[4] The paper trade directory[5] of the period reveals further that these plants were for the most part independently owned and operated. The impression thus given that this was a highly competitive industry is strengthened by the fact that there seems to have been quite a large number of firms entering or leaving the field from one year to the next. Secondly, the Census data show that the production of paper was concentrated in the most populous states, which may reasonably be assumed to have been those where the consumption of paper was heaviest. New York was the leading paper-making state, and Massachusetts and Ohio were the second and third largest, respectively. These were followed by Pennsylvania, Illinois and Connecticut. Thirdly, there appears to have been little shipment of paper over long distances. If one compares the production and consumption of printing paper[6] (the most important grade and the only one for which such information is available), it appears that the excess production of New England was probably sold in the neighboring state of New York, that producers in Michigan and Wisconsin sold to publishers in Illinois, and that paper from Ohio and Indiana was sold in Missouri. Altogether, one is led to conclude that production of paper was market-oriented. *Lockwood's Directory* reveals, further, that within the states there was a tendency for the industry to locate around populated rather than in rural districts.

Production at or close to the market was made possible by the technology of paper-making. The chief fibrous raw materials used[7] were straw, rags, waste paper and manila stock. The last three were readily available in urban districts, and straw could be grown in any nearby agricultural area, so that (unlike pulpwood which is described below) it did

[3] U. S. Department of the Interior, Census Office, *Tenth Census of the United States (1880)*, Vol. II, *Statistics of Manufactures*, p. 456.

[4] In 1879, 692 establishments produced an average per establishment of 650 tons of paper and board a year, while in 1939, the average output of 638 establishments was 21,000 tons annually. *Cf.*, U. S. Department of Commerce, Bureau of the Census, *Sixteenth Census of the United States: 1940, Manufactures, 1939*, Vol. II, p. 641 and 643.

[5] *Lockwood's Directory of Paper and the Allied Trades*, published annually by the Lockwood Trade Journal Company, New York. The data for this directory are collected annually in questionnaires returned by firms on a voluntary basis. The coverage for many years appears to be more complete than for the Census. The issues referred to here are the first, published in 1874, and those of 1878, 1883 and 1893.

[6] Figures on production of printing paper by state are given in the *Tenth Census of the United States*, Vol. II (cited above) page 456. Data on consumption for the same year may be found in U. S. Department of the Interior, Census Office, *Twelfth Census of the United States 1900*, Vol. IX, *Manufactures*, Part III, pp. 1056-1057. A summary table comparing production and consumption is given in *Dissertation*, p. 41.

[7] *Tenth Census of the United States*, Vol. II, p. 456. A summary table showing the use of raw materials in this and in selected later years will be found in *Dissertation*, p. 44.

not limit the choice of regions. Besides raw materials, a supply of clean water and power were prerequisites in choosing sites for paper mills, but these conditions could also be met in the vicinity of many urban districts.

Paper producers in 1880 thus were not confronted with a location "problem" in the sense of having to choose between a site near raw materials or a site near the market. As they began to use wood pulp during the late 1880's, however, their raw material picture changed completely. To make woodpulp it was necessary to obtain supplies of certain limited species of wood. Technological changes have enlarged the range of useable species in recent years but until 1920 the only kinds used in large amounts were spruce, balsam and hemlock.

The forests where these species grew in 1880 were for the most part at some distance from the principal centers of paper production described above.[8] The economically feasible sources were the wooded sections of New England, New York, Pennsylvania, the Lake States (Michigan, Wisconsin and Minnesota), and Quebec and Ontario. As far as one can judge from the available statistics, there were almost no supplies in many of the most important paper-producing states. Ohio, Indiana, Illinois, Connecticut and New Jersey are the outstanding examples. The supplies in Massachusetts were also small. In New York and Pennsylvania, and in Michigan and Wisconsin, which did have large stands, the existing paper mills were not close to the forests.[9]

Paper producers who wanted to use woodpulp, therefore,[10] now did have to decide between the alternative possibilities of producing near the raw materials and transporting the final product or producing near the market and transporting the raw materials (in the form of logs or of pulp). As the manufacture of paper from wood pulp has developed over the years, it has become clear that in most cases the best location for both pulp and paper mills is at the source of pulpwood. This is the result of certain technological factors which may be briefly enumerated. First is the great importance of a cheap supply of wood. Of all the production factors for wood pulp, wood is the most important, as a percent of total costs, and the one which tends to vary most significantly among regions.[11] Whether or not pulpwood costs for a region are low depends, in turn, on the adequacy of local supplies, in relation to total demand (including the demand of sawmills and other wood-using industries). In general, it does not seem to be economical to transport pulpwood logs over long distances. This is not only because wood loses weight in being made into pulp (it takes roughly two tons of wood to make a ton of dry sulphite or sulphate pulp).[12] As pulpwood grows scarce, its cost increases by more than the

[8] Figures on the stand of wood by species for these early years are not available as no systematic forest surveys were made. The best substitute for such information seems to be the data on the cut of lumber by state and species, which were collected in some detail. There was a saw mill boom in 1907, based in large part on the use of portable saw mills, and it seems not unreasonable to assume that any state in which the cut of spruce or hemlock was very low in the years around 1907 probably did not have a significant stand of these species. Data on the cut by state for selected years from 1899 to 1925 may be found in U. S. Department of Agriculture, *American Forests and Forest Products*, Statistical Bulletin No. 21, Revised edition, 1928, pages 124-211.

[9] This statement is based on *Lockwood's Directory*, cited above, which gives the location of mills by county.

[10] Not all paper is made from wood pulp. While it is the chief fibrous material used in making newsprint, wrapping paper, tissue paper, sanitary paper, and book and writing paper, and accounts for well over half of the total consumption of such material by the paper and board industry as a whole, very large amounts of waste paper are also used (in the production of various kinds of board). The use of rags and straw is now very small as a percent of total fibers. See U. S. Department of Commerce, Bureau of the Census, *Census of Manufactures: 1947* Vol. II, p. 329.

[11] See *Dissertation*, pp. 25-28.

[12] For a clear, non-technical description of pulp manufacture, see U. S. Tariff Commission, *Report on Wood Pulp and Pulpwood*, Report No. 126, 2nd Series, 1938, pp. 38-43.

cost of transport. Labor costs per cord are lower if the size of the logs is relatively large (as it is when wood is plentiful), and operations in the wood are more efficient if supplies are large enough to permit mechanization.

Another important technological feature of the industry is that wood pulp is most efficiently produced on a large scale in a big plant.[13] Thus, because the heavy capital investment involved in building such a plant must be amortized over a long period, plant sites must be chosen where the local wood supply is adequate for a very long time, if not perpetually. Care in cutting the forests to insure continued yield is essential. Finally, the cheaper grades of paper made from wood pulp (notably newsprint and wrapping paper) can be most efficiently produced in the same plant with the pulp. The economies thus achieved more than compensate for the slightly cheaper transport rates which obtain in the case of pulp. They are not as important in the case of high-grade paper (i.e., writing, book, tissue, and various kinds of special papers).

The necessity of producing pulp close to a large supply of wood and the advantages of integrating pulp and paper manufacture have been well known to the producers of paper and pulp in recent years. Sites for new mills are now selected with considerable care, on the basis of detailed forest surveys. It was not apparent, however, to most of the firms which undertook to make wood pulp in the first years after its introduction. The first wood pulp mills were located close to the existing paper mills—near the market for paper rather than near the forests. Many were built in such inappropriate situations as Massachusetts, Connecticut, Indiana and Illinois, or the non-forested counties of Maine, New York and Pennsylvania. At best, their pulpwood needs could be supplied from local sources for only a short time.

In general, these mills did not survive long. The competitive process seems to have taken its toll very much in the manner suggested by Hoover in the paragraph quoted in the introduction. More than 50 of the 135 pulp mills which were in operation or under construction in 1882 had closed by 1899.[14] In that year, judging from the Census[15] and from *Lockwood's Directory*, the pulp industry as a whole and the branches of the paper industry associated with it were much more reasonably situated, in relation to wood supplies, than they had been in the 1880's. The new and large pulp and paper mills were being built in the forested counties of New York, New Hampshire, Maine and Wisconsin, often on logging rivers.

In spite of the rapid elimination of many very inefficiently situated firms, however, the industry as a whole cannot be said to have adjusted itself by 1900 to all of the technological factors which were listed above. In particular, many pulp and associated paper mills (especially in upper New York State and New Hampshire) were built where the supply of pulpwood was adequate for a few years only. In part, this may be attributed to the exhaustion of wood supplies by the sawmill industry (described below), which could not have been readily anticipated by pulp producers in 1900. There seems, however, to have been another factor at work. Even after local shortages of wood had become quite apparent

[13] See, for example, U. S. Department of Commerce, Bureau of Foreign and Domestic Commerce, *United States Pulp and Paper Industry*, Trade Promotion Series No. 182, 1938, pp. 12-15.

[14] This statement is based on a tabulation of the mills listed in *Lockwood's Directory* for the years cited above. See *Dissertation*, pp. 55 and 56.

[15] *Twelfth Census of the United States*, Vol. IX, (cited above) pp. 1032-1033.

(as demonstrated by the rising cost of pulpwood,[16] the growing imports,[17] and the testimony of pulp producers themselves,[18]) more new pulp-producing capacity was built from 1900 to 1910 in regions where wood was scarce, like New York, than in the plentifully supplied states such as Maine and Wisconsin.[19]

Evidently, the thirty years from 1880 to 1910 were not long enough to bring into operation the "economies of experience." There seems to have been a continuing preference for locations near the traditional sites of paper production. Although they had learned to select pulp-mill sites where there was some pulpwood supply, investors still preferred, among such sites, the familiar rather than the unfamiliar. Not until the 1920's was the increase in the pulp-producing capacity of New York, New Hampshire and Pennsylvania finally brought to a halt. The same phenomenon occurred later in Michigan and Wisconsin. Wood supplies in these regions began to grow scarce during the 1920's, but the construction of new capacity did not stop until the 1930's.[20]

Altogether, therefore, the readiness with which inefficient firms dropped out of the pulp and paper industry during the first thirty years after 1880 was not sufficient to make it take on an entirely reasonable pattern of location. More time was needed for adjustment.

III—*Changes in the Supply of Wood*

The further adjustment of the pulp and paper industry was complicated by changes which occurred after 1900 in the Northeast and after 1920 in the Middle West, in the basic pulpwood supply situation. In the Northeast, the supply of pulpwood species became increasingly scarce after 1900 for several reasons. The most important was the sawmill boom of these years. The original, very extensive forests of New England, New York and Pennsylvania had been heavily cut for lumber. Each of these states in turn was the center of lumbering, and in each the supplies were exhausted. By 1900 the largest lumber-producing states were Michigan, Wisconsin, and Minnesota. Eventually (in the 1920's) the stand of these states also was depleted, but in 1900 there were still ample supplies.[21]

The movement of the center of lumber production to the Middle West, and transport of lumber from there to the East, was accompanied by (both as cause and effect) a rise in lumber prices. As a result, it became profitable, during the building boom immediately after 1900, to exploit with portable saw mills some of the eastern forests, which lumberers had formerly considered too remote, and also some of the second-growth stands.[22] The largest recorded production of lumber in New England was in 1907—the year when the United States as a whole reached a record level of absolute and per capita lumber production. There were similar revivals of lumbering in New York and Pennsylvania. Since the white pine (which was the preferred lumber

[16] See for example the figures on the cost of wood quoted by the International Paper Company in U. S. Congress, House, 60th Congress, 2nd Session, House Document No. 1502, *Pulp and Paper Investigation Hearings*, Washington, 1909, Vol. III, p. 1975. Other references may be found in *Dissertation* pp. 66-69.

[17] See footnote 24.

[18] *Pulp and Paper Investigation Hearings*, cited above, Vols. I, II, and III, *passim*.

[19] See the table in *Dissertation*, p. 70, compiled from the 1899/1900 and the 1909 editions of *Lockwood's Directory* (cited above).

[20] This statement is based on a comparison of the 1922, 1929, 1935 and 1940 editions of *Lockwood's Directory*.

[21] U. S. Department of Agriculture, Statistical Bulletin No. 21, *American Forests and Forest Products*, pp. 124-211. See also A. R. M. Lower, *The North American Assault on the Canadian Forest*, Toronto: Ryerson Press, 1938 Chapter VI for a general history of the early development of the lumber industry.

[22] U. S. Department of Agriculture, Forest Service, *Timber Depletion, Lumber Prices, Lumber Exports, and Concentration of Timber Ownership*, Report on Senate Resolution 311, Washington, 1920, p. 15.

species) in all these states had been largely cut off during the 19th century, the 1907 lumbering boom involved the cutting mainly of pulpwood species, i.e., spruce and hemlock. The amount of wood cut in these years for lumber was many times larger than the amount cut for pulp mills[23] and depleted severely the remaining stands.

This last gasp of the eastern sawmill industry affected very seriously the position of pulp producers in the Northeastern and Middle Atlantic regions. Pulpwood costs in these districts rose rapidly after 1900 and the importation of pulpwood logs from Canada increased steadily. The total grew from 370,000 cords in 1899 to 740,000 in 1906 and 950,000 in 1911. This last figure amounted to almost one-fourth of total United States pulpwood consumption for the year. Well over half of the imports went to New Hampshire and New York.[24] Since almost all of the pulp mills in these states had been built inland, on logging rivers, they were poorly situated to receive such shipments. If investors had anticipated this development, they might have selected sites on the shores of Lake Ontario or on the Saint Lawrence River to which it would have been possible to transport Canadian wood less expensively by water. As it was, however, most of the wood was carried by rail.

The overall pulpwood supply situation of the United States changed in another important respect also. By the late 1920's conditions of transportation, wood costs, technology and the location of paper markets had developed in such a way that the forests of the South and the Pacific Northwest, which had around 1900 been economically inaccessible to the pulp and paper industry, became excellent sites for the location of pulp and paper mills.

IV—*Locational Changes after 1910*

In Section II it was argued that the pulp industry and the parts of the paper industry which followed pulp, in spite of the elimination of many poorly-situated firms, did not take on the best possible economic location pattern in the thirty years following the introduction of wood pulp. The changes in the supply of wood described in Section III tended to make the industry as it stood in 1910 depart still further from the economic optimum. We shall now consider the substantial adjustments which occurred over the course of the four subsequent decades.

One is struck first by a marked difference (compared to the years 1880-1910) in the process by which the industry as a whole responded to locational forces. There was a great increase after 1900 in the scale of production and the physical size of a competitively viable paper or pulp mill[25] and a comparable rise in the cost of investing in new plants. The paper and pulp industries, of course, were not unique in this respect, since there was at this period a general tendency in all industries towards larger plant and heavier investment. It hit paper and pulp, however, with especial force for the ratio of capital to the value of

[23] U. S. Department of Commerce, *Historical Statistics of the United States, 1789-1945* (Washington: 1949), pp. 125 and 126.

[24] Figures for imports and total consumption by state may be found in the following sources: 1899: *Twelfth Census of the United States*, 1900 (cited above), Vol. IX, pp. 1030 and 1031; 1906: U. S. Department of Agriculture, Forest Service Bulletin No. 77, *Forest Products of the United States, 1906*, Washington 1908, pp. 69 ff.; 1911: U. S. Department of Commerce, Bureau of the Census, Forest Products No. 1, *Pulpwood Consumption 1911*, Washington, 1913, p. 8.

[25] The average capacity of paper machines increased from 2,800 tons a year in 1904 to almost 5,000 tons a year by 1919. The average capacity of chemical pulp digesters grew from 510 tons a year in 1899 to 2,950 tons in 1909 and 3,210 tons in 1919. Cf., *Twelfth Census of the United States* (cited above) Vol. IX, pp. 1034-1035, and U. S. Department of Commerce, Bureau of the Census, *Fourteenth Census of the United States, 1920*, Vol. X, *Manufactures*, p. 563.

output is higher for this industry than for many others.[26]

This seems to have affected the process of adjustment to the determinants of efficient location in two ways. First, it lessened the tendency of poorly located mills to go out of business as a result of high costs. The many pulp mills which had been closed between 1882 and 1899 had been small, and their liquidation did not involve heavy capital losses. The owners of the new large plants, however, were apparently inclined to continue production of pulp even after local supplies of pulpwood were exhausted and they had to bring wood at greater expense from other regions. As the size of plant and scale of production rose, so also did the proportion of fixed to total costs. Producers appear to have stayed in business, in the manner traditionally set forth in economic text books, as long as they could cover variable costs and some part of fixed costs.[27] The higher the proportion of fixed costs, therefore, the more slowly the competitive elimination of inefficient mills affected the location pattern of the industry as a whole. A comparison of *Lockwood's Directory* for 1899 and 1922 shows that although many pulp mills closed in this period (especially in Illinois and Indiana) they were almost without exception those of small capacity. For technical reasons mentioned below the staying power of the new larger paper mills seems to have been even greater than that of the pulp mills.

There was also a growth in the size of firms. Most conspicuous was the organization in 1898 of the International Paper Company which absorbed most of the newsprint mills and the associated pulp mills in New York and New England and eventually controlled two-thirds of the domestic output of newsprint.[28] (In general, the growth in size of firms affected the low-grade, rather than the high-grade branches of paper production.) These large firms were not able to eliminate competition but there can be no doubt that the paper and pulp market as a whole was less competitive than it had been in the 1880's.

The growing size of plants, however, affected the process of locational change in another, opposite, way also. It was suggested in Section II that producers before 1910 did not benefit as much as might be expected from the economies of experience. In the later period we are considering now, this does not appear to have been true. Possibly because the total investment in a plant, and thus the potential loss, increased as it did, investors in recent years (especially since 1930) seems to have selected plant sites with great care on the basis of extensive forest surveys. It is also possible that large firms are in a better position to undertake the necessary expensive surveys. The effect of this has been to make the industry tend to approximate more closely the optimum location pattern.

The increased size of pulp and paper mills, then, both accelerated and retarded locational change. Which effect predominated seems to have depended on how many new mills were being built. In the very rapidly growing wrapping paper and newsprint industries where

[26] U. S. Department of Commerce, Bureau of Foreign and Domestic Commerce, *United States Pulp and Paper Industry* (cited above), p. 12. In 1935 the capital assets of the paper and pulp industry amounted to $1.00 for every $1.60 of product, whereas the textile industry produced $3.30 per $1.00 of capital assets, the printing and publishing industry $3.10, and the makers of food and allied products $4.20.

[27] I have not been able to collect the kind of data on costs which would substantiate this guess. *Lockwood's Directory* shows that a large number of paper and pulp mills in the Northeastern and Middle Western States changed hands many times during the period 1900-1940. It seems not unlikely that some of these sales may have been made on the basis of greatly reduced valuation for the fixed assets so that, in subsequent operations of the mills, part of the original fixed costs were in effect ignored.

[28] United States Federal Trade Commission, *Report on the Newsprint Paper Industry* (Washington: 1917), p. 23.

capacity expanded several-fold in the 1920's and 1930's the tendency toward greater care in the selection of site was dominant. The production of newsprint moved to Canada[29] where there were far more abundant supplies of spruce, while the production of wrapping paper from southern pine has become one of the great new industries of the South. In both cases paper and pulp production are usually integrated and the locational change has affected both paper and pulp mills.

The growth of consumption and of total capacity, however, has been much slower in the case of high-grade paper, such as book, writing, tissue and other special kinds of paper made from wood pulp.[30] Here, therefore, the predominant result of the growth in size of plants after 1900 seems to have been to increase the life span of inefficiently located mills. The effects of larger fixed costs for paper and pulp mills were strengthened by other factors. First was the adaptability of paper-making machinery to the production of many different grades of paper. The machines are long-lasting, and can be shifted from the production of relatively unprofitable to more profitable grades of paper. This was done extensively in the older paper-producing regions after the First World War. The repeal of the tariff on newsprint in 1913 and the consequent growth of the Canadian newsprint industry put the many newsprint mills of New England, New York and the Middle West in a bad competitive position. After 1919 the bulk of them shifted to the production of other grades. Only the largest and most efficient (notably in Maine) continued to make newsprint. Smaller mills shifted part or all of their capacity to high-grade paper.[31] In this market, with a more differentiated product, these mills seem to have found competition less strenuous. Further capacity for the production of high-grade paper during the 1920's and 1930's was provided by mills which shifted from the production of sulphite wrapping paper.[32] The producers of this kind of low-grade paper whose manufacture had grown up in the forested areas of the Northeast and Middle West at the same time as the newsprint industry suffered keenly from competition with the rapidly increasing Southern kraft (wrapping) paper industry in the late 1920's.

Secondly, the paper mills of the older districts were able to continue operations because they did not have to rely entirely on local sources of pulp but were able to procure supplies from Scandinavia. Because of the world-wide prevalence of tariffs on all grades of paper except newsprint the extensive Scandinavian facilities for wood pulp production were devoted in the 1920's and 1930's to making pulp for export as a final product rather than as a preliminary step to the local manufacture of paper.[33] The shipment of pulp over long distances to paper mills is a more efficient process than the shipment of pulpwood logs to pulp mills; and Northeastern paper mills (especially in New York and Pennsyl-

[29] This was made possible by the repeal of the tariff on newsprint in 1913.

[30] While some other fibers (notably rags) are used to produce high-grade paper, wood pulp is by far the most extensively used material. Cf., U. S. Department of Commerce, Bureau of the Census, *Census of Manufactures: 1947*, Vol. II. p. 329.

[31] Of all the United States newsprint mills which operated between 1910 and 1934, eighteen, with an average capacity of 3,500 tons a day, were making newsprint in 1934; twenty-seven, average capacity 3,250 tons a day, were making some news and some other grades; thirty-four, with a capacity of 2,250 tons, had shifted entirely to the production of other grades (book, wrapping, writing, tissue, etc.); and thirteen, with an average capacity of 750 tons a day, had closed. Cf., American Paper and Pulp Association, "Some Economic Aspects of the Paper and Pulp Industry. Report of Industry Activities in 1934. Part II." *Monthly Review*, Vol. 2, Nos. 3, 4, and 5, March, April and May, 1935, p. 5.

[32] *Ibid.*, p. 9.

[33] For a discussion of this point, see *Dissertation*, Chapter 5, especially the table on page 192.

vania) were able to maintain and expand their production of paper from wood pulp even after the local high costs of wood had caused local pulp producers (in the late 1920's) to curtail the output of their mills or shut them down altogether.[34] The same was true of paper mills in Wisconsin and Michigan after 1935 when the wood costs of this region also began to rise.

Some of the paper mills which changed to the production of high-grade paper from imported pulp were very inappropriately located for the purpose.[35] As one writer pointed out about the mills of New York State, many would not have been built at all if they had not already been in existence in 1919 or, if they had, would have been built on different sites.[36] Those which were constructed in central Wisconsin, or in the Adirondack Counties of New York State, in order to use pulp produced by neighboring or affiliated pulp mills from local wood, were poorly situated for receiving imports. The pulp brought from Europe by paper producers in the Northeastern States had to be carried inland from ocean ports by rail,[37] and the Middle Western mills had to pay for rail shipment as well as for the extra cost of transport through the Saint Lawrence to the Great Lakes. Bringing pulp from Canada was no less expensive. Further transport charges were involved in sending the paper to the markets, for most mills were located close to the forests rather than to the cities where paper was consumed. In recent years the source of pulp purchases has changed. Scandinavian sales are now less important and more is bought from Canadian and from United States (mainly Pacific Northwestern) producers. Since these pulp shipments are made mainly by rail,[38] however, the new sources have made the paper industry take on if anything, a worse pattern of location with respect to raw materials than it had during the 1930's. Total ocean and other transport costs for Scandinavian pulp to the Northeast and Middle West were smaller in the 1930's than the average cost of shipment from the United States and Canadian pulp mills.[39]

Pulp produced locally was also expensive. The pulp mills which continued to operate in the Northeast and Middle West worked at an increasing disadvantage because they had to rely more and more heavily on imported wood as local supplies gave out. By the end of the 1920's the pulp mills of New York and Pennsylvania were importing more than half of the pulpwood they used.[40] In the

[34] Figures on pulp production by state for years before 1937 may be found in U. S. Department of Commerce, *United States Pulp and Paper Industry*, cited above, pp. 67-69. For 1937 and 1939 similar figures are given in U. S. Department of Commerce, Bureau of the Census, *Sixteenth Census of the United States, 1940, Manufactures, 1939*, Vol. II, Part I, p. 639. Data on paper production by state and by grade for 1937 and 1939 may be found in this same volume on pages 645 and 646. For earlier years see U. S. Department of Commerce, Bureau of the Census, *Census of Manufactures, 1914*, Vol. II, pp. 617-618 and *Fifteenth Census of the United States, Manufactures: 1929*, Vol. II, pp. 548 and 549. Information about the number and capacity of pulp mills by state can be found in *Lockwood's Directory*, published annually. A summary table for 1929 and 1951 is given in *Dissertation*, page 127.

[35] Not all of the rapid growth of pulp imports which occurred after 1919 can be attributed to purchases made by mills which had formerly bought pulp from neighboring or associated pulp mills. As early as 1900 there had been a number of fine paper mills in New York, Pennsylvania, Massachusetts, Ohio and Michigan which bought pulp from abroad or from other regions of the United States. Purchases of this sort were expanded after 1919 (see *Dissertation*, pages 151-155). The decline in pulp production and the rise in pulp consumption in New York, Pennsylvania and (later) Wisconsin, however, as well as the continued operation of some paper mills whose affiliated pulp departments had closed (shown in *Lockwood's Directory*), suggests that a significant part of the rise in imports can be attributed to purchases which would formerly have been made locally.

[36] New York State Division of Commerce, *The Paper and Pulp Industries of New York State* (Albany: 1942), p. 31.

[37] U. S. Tariff Commission, *Report on Wood Pulp and Pulpwood*, Report No. 126, Special Series, 1938, pp. 178-188.

[38] John A. Guthrie, *The Economics of Pulp and Paper* (Pullman, Washington: The State College of Washington Press, 1950), p. 81.

[39] U. S. Tariff Commission, *op. cit.*, pp. 178-188.

[40] See the table in *Dissertation*, p. 109. It is based on U. S. Department of Agriculture, *American Forests and Forest Products* (cited above), p. 268, and U. S. Department of Commerce, Bureau of the Census, *Fifteenth Census of the United States, 1930, Manufactures, 1929*, Vol. II, p. 572.

1930's the proportion of imported wood used in Michigan and Wisconsin also increased considerably and it still amounted to 25 percent of total pulpwood consumption in 1947 and 1952.[41] Since the mills were old and small, operating costs were also considerably higher than they were for the new and more efficient mills built in the Pacific Northwest and the South.[42]

Altogether, since pulp is the most important and most variable cost element in producing high-grade paper,[43] it appears that, if all high-grade paper mills had been destroyed, say in 1934, only about one-half of total capacity would have been rebuilt where it was. Production in the forested areas of Maine, New York, Wisconsin and other states would have been limited to the amount of paper which could be produced from pulp made with local wood supplies. Mills using imported pulp would have been located (as a few have been in very recent years, for example in New Jersey) near or at ocean ports and consuming centers. It seems unlikely that any mills would have been built in the Northeast or Middle West with the intention of using mainly pulp produced in the South or Pacific Northwest because the production of paper could probably be more efficiently carried out at the source of supply of pulp.[44]

In spite of the extent to which the location pattern diverged from this ideal, however, the paper mills of the Northeast and Middle West have continued to dominate the high-grade paper market until very recently. Not until 1948[45] was any substantial capacity for book paper production built on the Pacific Coast and as late as 1953 *Lockwood's Directory* shows only one southern mill producing this grade. Much the same appears to be true of bond (writing) paper, absorbent paper and tissue paper. The production data given in the 1947 *Census of Manufactures*[46] (unfortunately the latest available) tell the same story. The production of the older paper-producing districts accounted for 84 percent of the total output of book paper, 95 percent of special printing papers, 84 percent of the writing paper, and 87 percent of tissue paper. Since imports of these grades are unimportant, this means that these regions have remained the principal source of supply. This is in contrast to the situation of newsprint and wrapping paper. Although the older paper-producing regions were once almost the sole suppliers of these grades, by 1947 they provided less than half of total consumption.

As was implied above, the main reason for the staying power of relatively inefficient mills seems to have been that

[41] U. S. Department of Commerce, National Production Authority, *Pulp, Paper and Board, Industry Report, Annual Review*, March 1953, p. 15. In recent years (since 1939), the proportion of imports for New York and Pennsylvania has fallen to about this same level. This reflects the fact that pulp production has come to be limited more closely to grades of pulp which can be produced from pine and other locally available species.

[42] See U. S. Tariff Commission, *Wood Pulp and Pulpwood*, pp. 208-209, 227-231, and 242-244, and Guthrie, *op. cit.*, pp. 146-148.

[43] See the tables in Guthrie, *op. cit.*, Ch. XI, pp. 151-164.

[44] Guthrie finds that, in the manufacture of writing paper, the lower pulp costs for Pacific Coast mills were offset by higher conversion costs and administrative and selling costs that prevailed for the "average" United States mill. This does not necessarily disprove the point made here because "conversion" costs include some element of fixed costs, and here, as was pointed out above, the advantage of the older mills in the Northeast and Middle West may arise from some writing-down of the assets. For this reason, and because accounting systems differ in the way in which all kinds of costs are allocated, I have not found it possible to gauge regional advantage very closely on the basis of cost figures. For example, Guthrie's figures show that "selling and general administration costs" are much higher per ton of paper produced on the Pacific Coast in the case of almost all grades of paper. It seems that this must be the result of differing accounting systems. His data show, for all grades except writing paper, lower costs per ton for the Pacific Coast than for the Northeast and Middle West. He suggests that this may be offset by higher freight rates to Eastern markets. This would limit the extent to which new mills would be built on the Pacific Coast but it should be remembered that high transport costs also apply for shipments of pulp from the Pacific Coast to Eastern mills. See Guthrie, *op. cit.*, pp. 151-164.

[45] *Ibid.*, p. 10.

[46] U. S. Department of Commerce, Bureau of the Census, *Census of Manufactures, 1947*, Vol. II, pp. 334-336.

not many new mills were built between 1919 and 1939 to produce high-grade paper in any area. United States' consumption of paper expanded from 6,300,000 tons in 1919 to 15,900,000 tons in 1939, but the increases consisted largely of low-grade wrapping paper from the South, sulphate board from the same area, and imported newsprint. The growth in the use of high-grade paper was more moderate and involved no more expansion of capacity than could readily be provided by the existing paper mills in the Northeast and the Middle West. As a result of the shifts in grade discussed above and with some renovation and expansion of the facilities of other mills, the high-grade paper industry appears to have suffered from overcapacity during the entire period. The mills, in short, were there and their very existence prevented the construction of new high-grade mills in better locations. Thus, the economies of experience could not operate.

It is the writer's guess that, because of the changes which have affected the paper industry as a whole since the 1930's, many of the existing high-grade paper mills would not survive another depression. As consumption of low-grade wrapping and newsprint declined, it seems likely that some of the large new and efficient mills producing these grades would be converted to the production of high-grade paper (as newsprint mills were in the 1920's). It is hard to see how some of the Middle Western and Northeastern mills could meet this competition.

A further factor which may have increased the immunity of the industry to the determinants of efficient location was the zone price system which was introduced under the NRA for manufacturers and merchants of book, writing, tissue and other fine paper.[47] Under these arrangements, sellers absorbed some part of the freight bill. However, although this may counteract the effects of relative advantages or disadvantages in the location of mills *vis a vis* the market, it is hard to see how it would offset the advantages which new and better-situated mills (had there been any) would have had *vis a vis* raw materials.

Another, and more effective way in which the extent of competition was curtailed for high-grade paper manufacturers was through the tariff on all such grades. This was high enough to prevent imports almost completely. If there had not been a tariff, it seems likely that the paper manufacturers of the older districts would have had to face keen competition from the same Scandinavian and Canadian mills from which they bought pulp. Labor and other manufacturing costs were relatively low abroad, foreign pulp producers had ample technological skill and the total transport costs to United States markets would in many cases have compared favorably to those of United States mills.[48] The tariff explains in part the different rates of locational change in the high-grade paper and newsprint industries. It does not, however, account for the difference between high-grade paper and wrapping paper for the latter was also protected.

V—*Conclusions*

This brief survey has shown that the location pattern of the manufacture of low-grade types of paper, and the pulp from which they are made, has gradually come to approximate what seems to be economically its most efficient form. Moreover, the adjustment has been carried out partly in the manner suggested by Hoover—through the competitive elimination of inefficient firms.

[47] Guthrie, *op. cit.*, pp. 111-114.

[48] See *Dissertation*, pp. 255 ff. This discussion is based on a number of sources. One of the most readily available is U. S. Tariff Commission, *Wood Pulp and Pulpwood*, cited above.

An important role was also played by the economies of experience. New firms have benefited, in selecting a site, from the experience of their predecessors. There seems to be evidence, however, of a lack of such adjustment in one branch of the paper and pulp industry—namely, the firms which made high-grade paper. How, briefly, did this part of the pulp and paper industry differ from the other parts?

Since the adjustment process is assumed to be effected by competitive forces, it is appropriate to inquire first about the extent of competition. If one judges by the average size of individual firms in relation to the entire market, then the high-grade paper mills have been and are, if anything, more competitive than those making newsprint and wrapping paper. The latter, especially in the years since 1930, have come to resemble what is usually described as oligopoly. If, on the other hand, one judges by the extent to which competition takes the form of differences in quality rather than in price, then the newsprint and wrapping paper industries (whose product is more standardized) appear to be more competitive. There has been, moreover, no delivered price system in these fields.

On the whole, however, the presence or lack of competition does not appear to account for the differences between the rate of locational change in the manufacture of high-grade and low-grade paper. A more satisfactory explanation seems to lie in the factors which mitigated the substantial degree of competition which did exist. In summary, these were: (1) The relatively high proportion of fixed to total costs and the durability of machines and buildings. (e) The adaptability of paper-making machinery to the production of different grades of paper. (3) The slow growth of consumption of high-grade paper compared to other kinds of paper. (This is perhaps the major difference between the high-grade paper manufacturers and the rest of the paper and pulp industry.) (4) The availability of imported pulp. (5) The tariff on high-grade paper. (It was suggested above that this may explain in part the way in which high-grade paper differed from newsprint, but not the way it differed from wrapping paper.)

From the first three points above, it may be argued that, in cases where fixed costs are high and assets long-lasting and where there is relatively little growth of consumption, one perhaps cannot expect competition to operate as an effective location-adjustor. Under these circumstances, general depression and overcapacity in the industry may have the primary effect of preventing new firms from entering rather than eliminating old ones: i.e., they may perpetuate the existing inefficient pattern. It also seems possible that, in the case of newsprint and wrapping paper, the speed of adjustment to the most efficient location pattern may have been accelerated by the growth of the size of firms relative to the market, which might be considered as a diminishing of competition in the usual sense. Around the turn of the century the existence of many small firms seems, if anything, to have increased the chances of selecting a poor site initially. Since many of the firms building mills in New York State, for example, were too small to consider the possibility that they would affect the supply of pulpwood, total capacity in some parts of the state became too large relative to locally available wood. The much larger and less competitive firms of recent years have tended to give more consideration to the long-run supply of wood. As they have made up a larger proportion of the industry, therefore, it has approached more nearly

the ideal location pattern. The large capital funds at stake seem to have encouraged these firms to pay more attention to the lessons of experience. Perhaps time also plays an important role here. Possibly adjustment is more rapid after an industry has passed through the early stages of its development and new firms can profit from the mistakes of their predecessors.

To the extent that these observations are valid one must modify the assumption that competition will automatically bring about locational adjustment. At least in the high-grade paper industry, high fixed costs and the availability of existing mills which had shifted from producing other grades of paper were sufficient to counteract the effects of competition, given the slow growth of output. Whether the same factors operate in the case of a significant number of other industries would be hard to say without further study.

It is now appropriate to ask how the interests of consumers have been affected by the slow adjustment of the high-grade paper industry. The question is complicated. There are two senses in which an industry may be said to be poorly located. First, the location may be "poor" in the sense that, if the entire industry were destroyed, plants would not be rebuilt on the same sites. As was pointed out above, this would certainly be true of the high-grade paper industry and to a lesser extent of the pulp mills in the older pulp and paper-producing regions of the United States today. Such a destruction and rebuilding of the industry, however, would not necessarily benefit consumers. Once capital funds have been invested in fixed plant and equipment, they can be withdrawn and used for other purposes only to a very limited extent[49] (the scrap value of the machinery may be all that can be recovered). Thus, even though a new location or new equipment might be technically more efficient than the location and equipment currently in use, there would be a loss involved in scrapping the old plant. This might more than offset the gains in efficient operation to be achieved by building a new one. In some cases it may even be profitable to invest in an old plant which, in the light of current technology, is outmoded or inefficient or badly located. If the capital value has been sufficiently written down, such a firm may still be competitively viable.

Where the continued operation of poorly-located mills, on the basis of written down assets, depressed the market so as to prevent the construction of new and better-located plants, it would appear that consumers were being subsidized by past mistakes in the investment of capital (The "mama and papa" grocery stores are an example of a similar phenomenon). Total national product resulting from a given amount of investment would undoubtedly have been higher if the high-grade paper mills had been better located initially. Once the mills had been built, however, it may have been better, from the point of view of consumers, to operate them than to close them. Perhaps, therefore, one should not, in this sense, say that the the mills were poorly located. One should rather include among the present determinants of optimum economic location the correct or incorrect decisions which were made in the past about locating firms. Not only the existence of capital equipment should be considered in this connection. Past economic ac-

[49] The most complete general discussion of this problem which I know is in an article by Ludwig Von Mises, "Das Festangelegte Kapital," reprinted in *Grundprobleme der National Ekonomie* Jena: 1933, pp. 201-214.

tivity also affects the availability of raw materials, such as pulpwood logs, and the geographical distribution of the labor force.

We are led, then, to define a poor location in another way. For the economist an industry is poorly located if the continued operation of some firms results in a lower real national product from a given set of productive resources than could be obtained if they closed. Here, the existing capital equipment is included among "productive resources." Was the high-grade paper industry poorly located in this sense? To the extent that some mills were able to continue production only because they were protected by tariffs from competition with papermakers abroad or by their own delivered price system from competition with one another, it was. To this extent, therefore, the interests of consumers were not being served. There can be little doubt that some of the high-grade paper mills would have had to close in the face of competition from abroad. Spokesmen for the industry argue that this also would be the effect of suspending the delivered price system through anti-trust prosecution.[50]

The usual objections to the encouragement of competition by public policy[51] may be strongly raised in this particular industry. If one considers the period of the 1930's, the effect of the removal of the tariff, especially, would have been unfortunate, causing severe distress in some regions. The small towns of upstate New York where paper was the sole industry come particularly to mind. This objection does not apply, however, to the initial imposition of the tariff, nor to its removal in prosperous periods, when other employment is available. The likelihood of a perpetually inefficient use of resources (mentioned as a possibility in the introduction) depends mainly on this kind of deliberate curtailment of foreign and domestic competition.

It was concluded above that the continued operation of technologically poorly-situated mills may be in the interests of consumers. It does not follow that public policy should be directed to prolonging the life of these mills beyond that which they would achieve without government aid. Perhaps for consumers the main detrimental effect of the initial mistaken decision about the selection of a plant site lay in the ability of producers to persuade Congress to underwrite their mistakes. In this respect the paper industry was, unfortunately, not unique.

[50] Guthrie, *op. cit.*, pp. 102 ff.

[51] *I.e.*, that it may cause unemployment or set in motion a chain reaction of reduced spending and income.

Needed Improvements in the Census for Housing Users†

By MORTON HOFFMAN*

RECOGNITION by the Bureau of the Census of the data requirements of public and private groups interested in housing statistics has come primarily through the two decennial housing censuses. In addition, the Census Bureau has conducted a series of specially adapted surveys at the request and expense of local housing authorities. These have ranged from advance special tabulations of the 1950 Census for individual communities, providing detailed data on the extent and occupancy of deficient housing and on incomes and rents and rent-income ratios of families of two or more persons inhabiting substandard housing,[1] to a fairly new sample survey device providing current rent and income distributions of families of two or more persons residing in dwelling units found to be substandard in 1950. The latter tool is extremely helpful in providing up-to-date family income data, thereby facilitating readjustment of local housing authorities' income admission limits —a most vital function and one difficult to fulfill in 1953 or 1955 on the basis of 1949 data. This new modest-cost procedure, worked out cooperatively by the Economic staff of the Public Housing Administration and the Housing staff at Census, illustrates the admirable responsiveness on the part of the Bureau to changing circumstances of local and federal public housing agencies.

In fact, it is only a slight exaggeration to say that the 1,000 local housing authorities in the country could hardly function without Census data. A local authority must fulfill legal and public opinion requirements by ascertaining the extent of substandard housing, the areas in which it is concentrated, and the income distribution by race of lower-income renter families inhabiting this badly deficient housing. These and related data must be transmitted to the PHA in connection with the submission of proposed development programs for new housing projects, as well as with reviews of income limits for admission and continued occupancy. They also provide an accepted objective measure of housing conditions in the locality so that all interested public and private groups can understand the significance of these data in terms of the need for programs of low-rent public housing in their community. Census tract and block statistics data available for large cities are valuable for a variety of purposes, including site selection of slum clearance projects and obtaining estimates of families to be relocated as a result of such clearance.

All students of housing should be intimately familiar with all Census and other data relating to the size, composition, quality, and intensity of occupancy of the housing inventory in their urbanized area, along with information on financial characteristics of dwellings, housing costs, and family income. While each analyst naturally has his special viewpoint, the interests of the public housing analyst differ in degree rather than kind from that of technicians of other federal or local programs of com-

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† Based on a paper presented at the September 1954 Annual Meeting of the American Statistical Association, panel on "Needed Improvements in the Census from the Standpoint of Social Statistics Users."

[1] Substandard housing as defined by the PHA connotes a dwelling unit that is dilapidated or lacks a private inside flush toilet or bath or hot running water.

munity betterment. The public housing analyst is primarily concerned with the low-income market and substandard housing; the technician in the redevelopment, rehabilitation or conservation agency or in the Federal Housing Administration deals more often with income groups higher in the scale. But how can the top point of the low-income market, or the precise range of the middle-income sales and rental markets, be determined in times of rapidly rising family income, high mobility, and shifting patterns of racial occupancy and changing neighborhoods, without studying other segments of the market? Some of these agencies are more concerned with social needs and others with demand, but their data requirements have a great deal in common. Although the observations offered below are based primarily on the needs of governmental housing programs, they are also largely in keeping with the statistical requirements of fields ranging from social and physical planning to real estate investment and finance.

A critique intended to be constructive and realistic must of course take cognizance of the budgetary exigencies of a Decennial Census. If regret is expressed that Census has not published the nonwhite breakdown, or a larger proportion of the contemplated, extremely useful family-housing analytic cross-tabulations for standard metropolitan areas and cities,[2] Census officials may reply that the Bureau so intended, originally, until financial circumstances prevented it. Budgetary difficulties unfortunately have forced the curtailment of the proposed monograph program recommended by advisory groups. More recently, the proposal for a comprehensive intercensal housing survey in 1955 was whittled down to $500,000 by the Administration before finally being thrown out by the House-Senate Committee on Appropriations. There is no implication, therefore, in any of the following observations of unawareness or lack of knowledge or interest on the part of the Census Bureau's housing or family or income-statistics specialists.

Emphasis on the past, current, and future importance to public and private programs of civic reconstruction of modified or additional Census housing and family-housing and income statistics may, however, help prevent their subordination by top Census and other federal officials to other also worthy candidates for inclusion in the Census. Such groups as marketing specialists, demographers, and social workers may find invaluable and revealing new information in the family-housing cross-tabulations, known as the HB series, and should therefore urge their continuance and broadening for the next Census.

The observations offered below are concerned primarily with several aspects of the Housing Census, and mobility, family type, and income statistics on the population side. Consideration has been given to (1) difficulties flowing from a comparison of 1940 and 1950 data, (2) deficiencies in the 1950 Census (as noted with the advantage of hindsight), (3) changes in housing occupancy and family-income patterns since 1950, which make 10 years too long a period to rely on 1950 data, and (4) what is important to have in any intercensal study and in the 1960 Census, in view of these trends and the broadened scope of federal and local governmental housing policies.

Conversions

Information on conversions was covered in 1940 but omitted from the 1950 Census of Housing. Apparently secur-

[2] See Committee on Housing Research, Social Science Research Council *Recommendations to the Bureau of the Census on 1950 Housing Census—Cross Classifications and Monographs*, January 15, 1951.

ing information on the number of units in converted structures is difficult, but so are "year built," "type of structure," and other items. The 1940 data indicated that of 199 cities with 50,000 or more population, Baltimore had the tenth highest percentage of units in converted structures—21 percent.[3] In view of the Bureau of Labor Statistics' pilot sample survey estimate of almost 14,000 converted dwelling units from 1940 to 1949 in Baltimore City,[4] Baltimore's ranking and proportion in this respect might have been even higher in 1950. If so, this would be an important clue to analyzing changes in the area's housing during the decade and in considering the possible redevelopment patterns of the next decade. Learning the magnitude of the number of units in converted structures and their characteristics in a census might serve to verify a hypothesis that the age of Baltimore structures, its land use pattern, and the shift from white to nonwhite occupancy in older city areas, are related to the high proportion of converted structures.

Another important reason for obtaining data on conversions is the expectation of declines in quality and size of converted units. While there is no reason to suppose that all conversions produce inferior dwelling units, practically every conversion results in a drop in the average size of dwellings.[5] It is theoretically conceivable that a vigorous local housing law enforcement program could be causing the installation of private toilets (and baths, where the Housing Code's standards so required) in practically all units without such a facility prior to a certain date, but for the rate of conversions (especially illegal conversions) to cause a net increase in units without private sanitary facilities because of the additional units being created without such amenities.

It is true that the volume of conversions was very high during the 1940's, partly as a by-product of such wartime concomitants as acute housing shortages, rent control, and governmental and civic promotion of homes registration programs. Nevertheless, many conversions are still taking place in Baltimore; how much this may be traceable to the continued existence of city-administered rent control, the dramatic shift in racial occupancy in sections of the city, and the almost total lack of new private rental housing, is not clear. The new emphasis in Washington and localities on "urban renewal," stemming from the Housing Act of 1954, may serve as a new stimulus to conversions. A considerable rise in rents likely to occur in improved structures may well serve as another motivation for moving to the already highly mobile lower-income or lower-middle-income renter-occupants; converting to a larger number of smaller units while refurbishing may seem sensible or necessary to many landlords of upgraded structures.

Information on the extent and characteristics of converted units by city sections would prove helpful to students of changing housing patterns and city officials and groups interested in appraising the progress and results of the newer and older government housing programs.

Renters or Owners?

Thinking through the statistical implications of new urban renewal programs makes one wonder about the adequacy of so basic an item as present tenure

[3] U. S. Bureau of the Census, 16th Census of the United States, *Housing, Vol. II, General Characteristics, Part 1, U. S. Summary,* (Washington: 1943) Table 74.

[4] B. Lipstein, "How Important Are Conversions in the Current Housing Scene?," *Housing Research,* Housing and and Home Finance Agency, Spring 1952, pp. 1-14.

[5] Community Appraisal Study. *Report on Housing and Social Survey,* Hyde Park-Kenwood Community Conference and South Side Planning Board, 1952, p. 23, and A. M. Woodruff, "Conversion of One-Family Houses to Multi-family Use," *Housing Research,* Housing and Home Finance Agency, April 1954, pp. 11-19.

statistics. Is the simple renter- and owner-occupancy dichotomy sufficient? Many economists have commented on the changing nature of home ownership in these days of thin equities and extended amortization periods made possible by federal mortgage insurance and guaranty. In general, this financial side is dealt with handsomely in Volume IV, *Residential Financing*, of the 1950 Census of Housing, although additional data are needed to complete the picture of the full costs of home ownership.[6] Neither "renter" nor "owner" can be precisely applied, however, to "contract-of-sale" houses, a lease-purchase scheme in which the occupant thinks he is buying, puts down $250, but doesn't secure the title until four or five years of paying $15 or $20 a week (including interest) to build up the necessary equity on his usually overpriced house.

A new edition of an authoritative work points out that "a good deal of this type of possession is reputed to have been forced within the past 10 years by previous owners because of their desire to avoid rent control or payment for correction of violations."[7] In Baltimore the accelerated transfer of homes from white to Negro occupancy in recent years has involved a considerable amount of selling on a land-installment contract basis. A 1954 Community Self-Survey, sponsored by the Maryland Commission on Interracial Problems and Relations and in which a sample of 1,344 Negro households were interviewed, showed that 38 percent were homeowners and that 53 percent of the "owners" were purchasing under a contract of sale agreement.[8] Philadelphia has also experienced a tremendous increase in lease-purchase agreements in the past 10 years, confined mostly to low-income Negro neighborhoods.

Contract ownership is not confined, however, to this type of housing market situation in older city areas. Three of the biggest West Coast builders are now successfully marketing new homes in new California suburbs with a contract arrangement whereby they retain ownership for 20 years, according to an elaborate write-up in a widely-read trade magazine.[9] In addition, some of the new financing mechanisms being considered for urban renewal may also stimulate contract ownership.[10]

The sample Survey of Residential Financing, taken as part of the 1950 Census of Housing, does provide information on the number of owner-occupied homes under contract to purchase for the United States, regions, and 25 large s.m.a.'s. About 585,000, or 8 percent of the 7 million owner-occupied, mortgaged, 1-dwelling unit structures in the U. S. were estimated in this category in 1950. The continuing entrance into contract arrangements of sizeable numbers of families in concentrated older areas of cities and new suburbs points up the

[6] For recent discussions of this subject, see William I. Greenwald, "The Actual Costs of Home Ownership," *The Southwestern Social Science Quarterly*, March 1954, pp. 45-59; and M. Mead Smith, "Monthly Cost of Owning and Renting New Housing, 1949-50," *Monthly Labor Review*, August 1954, pp. 851-858.

[7] L. N. Bloomberg, H. G. Brunsman, and A. B. Handler, "Urban Redevelopment," *America's Needs and Resources* (New York: 20th Century Fund, 1955), chap. 16, p. 503.

[8] Maryland Commission on Interracial Problems and Relations, *An American City in Transition* chapter on "Housing and the Negro Public," 1955. The report refers to the following factors as responsible for this development: "High level of demand for housing by nonwhites; shortage of rental housing of better quality; relocation requiring families to discover new residences; difficulty in getting regular financing through established institutions; and sudden accessibility of housing of somewhat better quality through release by white families moving to county and peripheral areas."

[9] *House and Home*, February 1955, p. 121.

[10] Section 221 was added to the National Housing Act in 1954 for families displaced by governmental action, whereby the FHA system of mortgage insurance was extended to cover a 5-percent down payment, 30-year amortization plan. The proposal originally advocated by the President's Advisory Committee on Government Housing Policies and Programs called for no down payment, 100-percent loan, and a suggested initial contract status. If a lease-contract provision should be reincorporated in this or similar schemes, further incentives to contract ownership schemes would result.

importance of obtaining much more information on such homes on a census rather than a sample basis. Thought should be given to adding a third in-between tenure category[11] in the 1960 Census, by census tract in larger urban areas, with a breakdown by race, and with tabulations of such housing and occupancy characteristics as size and age of home, condition and plumbing facilities, value, family income, and value-income ratio. This would be important information for mortgage lending institutions, federal and local housing and redevelopment agencies, interested community organizations, and social welfare agencies. Heartaches, financial hardship, and administrative and legal problems can result from enforcement of local housing code provisions requiring substantial improvements on old deficient homes newly "acquired" by families buying under contract. Knowledge of the existence and characteristics of a large number of homes being occupied on a contract basis by working-class and lower middle-income families of a minority group in particular areas would be useful for local agencies to have prior to decisions for extensive rehabilitation as the heart of an urban renewal program.

Housing Quality

The term "needing major repairs," used in the 1940 Census of Housing to measure structural condition, was severely criticized in the 1940's. Following an elaborate study made by the Census Bureau in cooperation with a federal interagency committee on housing adequacy, the 1940 concept was replaced by the concept of "dilapidation" for the 1950 Census. It was decided ". . . that the level of quality to be measured, fundamentally, was whether or not the dwelling unit was capable of providing adequate shelter or protection against the elements, and sufficient safeguards for the safety of the occupants. The Committee concluded that the term 'dilapidated' most accurately described the concept it had recommended for measurement."[12]

Apparently the quality rechecks of housing and population items from the 1950 Census showed "dilapidated" to be neither the poorest nor the best. However, the Bureau admits ". . . . although the enumerator was provided with detailed oral and written instructions and with visual aids, it was not possible to eliminate completely the element of judgment in the enumeration of this item . . . . some enumerators obtained too large or too small a count of dilapidated units. Consequently, data on condition for small areas . . . . are subject to a wider margin of error than . . . . for larger areas."[13] Awareness of this situation and perhaps lack of understanding of the factors resulting in the selection of the less inclusive term "dilapidation" have led to concern about its adequacy on the part of housing analysts. The fundamental importance of the measurement of condition warrants a careful review of its usefulness. I confess my reluctance to see a new term such as "structurally deficient" adopted, which might cause the same difficulties in comparing the 1960 equivalent of the 1950 term which local analysts have had in comparing 1950's with 1940's!

A related question in the housing quality field is whether the combination of condition and presence of three plumbing facilities constituting the substandard definition of housing and re-

[11] For a delineation by Charles Abrams of 11 new forms of urban tenure throughout the world, "including certain types of pseudo-ownership and some that stand midway between ownership and tenancy," see *Urban Land Problems and Policies*, Housing and Town and Country Planning Bulletin 7, United Nations, 1953, pp. 18-19.

[12] U. S. Bureau of the Census, *U. S. Census of Housing: 1950, Vol. I, General Characteristics, Part I:* U. S. Summary, p. xix.

[13] *Ibid.*, p. xix.

development agencies today will still serve as a reliable short-cut indicator of basic substandardness of the house by 1960 in the face of intensified drives to install inside toilets and baths under strengthened local housing codes. Aside from any doubts about the adequacy of "dilapidated," a sharp reduction in the number of outside toilets or shared baths in several communities may greatly weaken the meaning of substandardness for those areas. It would also limit the value of comparisons of 1960 with 1950 housing conditions in those cities, as well as comparisons of substandardness among all cities that are made for a particular Census. It is true that Census does not state that such and such combination denotes substandardness—and that it also provides data on heating equipment and fuel, cooking fuel, electric lighting, and kitchen sink. Nevertheless, the Bureau should be aware of this problem of some of its housing agency users and should stand ready to adapt or add to its items of measurement in light of the possibly diminished utility of combinations of them.

Perhaps the most trenchant critic of the Census criteria of housing quality is Allan A. Twichell, long associated with the American Public Health Association's comprehensive and complex method of appraising the quality of housing. Twichell has observed that ". . . . from the standpoint of measuring the problems of specific slum or blighted areas . . . the Census data have several basic limitations. These arise from the small number of quality items enumerated, from the absence of a rating scale or other cumulative expression of housing deficiencies, and from the selection of data for publication on small areas."[14] In addition to ignoring many items on sanitary and safety conditions in dwellings, the Census does not evaluate the physical environment of dwellings. "Any judgment as to the long-term use of residential areas must take serious account of their present environmental factor. No survey method that omits them gives more than a partial evaluation of the slum clearance and redevelopment problem."[15]

From the viewpoint of public housing or redevelopment agencies clearing well-identified slum areas, these strictures of Twichell do not appear material when use of the 1950 Housing Census findings is reviewed. The few Census quality items are sufficient to denote acute problem areas, and intensive up-to-date Census-type or other surveys are probably found necessary in the specific blocks involved in any event. The Census findings on substandardness, while crude, are sufficiently useful then for site selection in overwhelmingly substandard areas, and permit public understanding and acceptance of necessary action. This is aided by analysis of Census tract data (for the 70-odd cities for which they are available) which permit comparative charting of data on percentage of renter occupancy, median rent and value, percent of nonwhite occupancy, percent of crowding and doubling up, percent of dwelling units dilapidated or lacking private toilet or bath, percentage without central heating, and percent built 1919 or earlier.

Approaches toward scaling may warrant study and experimentation. One might be gradations of condition (if not of dilapidation itself then of structural and design deficiencies of consequence short of dilapidation) which would assist the data user and permit him to develop his own index. A second would be a count of basic facilities lacking by condi-

[14] Allan A. Twichell, "Measuring the Quality of Housing in Planning For Urban Redevelopment," *Urban Redevelopment: Problems and Practices*, Coleman Woodbury, Editor (Chicago: University of Chicago Press, 1953), p. 21.

[15] *Ibid.*, p. 22.

tion of unit, which was actually done in the 1949 Pilot Census in Baltimore. While this procedure has its limitations because of the cost and the implication that all deficiencies have equal weight, it would be welcome additional data to the local analyst. The identification of tracts or smaller areas with severe as against slight and no deterioration in combination with multiple deficiencies as against a single plumbing or other deficiency would be of real value. This would hold not only for official agencies concerned with planning and the clearance of rock-bottom slums but for public and private groups interested in rehabilitation and conservation desirous of spotting those areas descending into the blighted category.

The Twichell comment that may be more timely today with broadened housing legislation is ". . . . however well a survey serves the needs of a slum clearance and public housing program, its efficacy may be questioned if it does not serve the needs of rehabilitation and conservation programs also."[16] For these new programs of housing and neighborhood improvement above the level of rock-bottom slums it would appear that a broadening of Census coverage of housing quality would be helpful, if feasible within the Census framework. From this view, it would be valuable if the Census could provide information about sanitary and safety aspects of housing (dual egress, fire hazards, windowless rooms, etc.) to help awaken the community to the needs of housing law enforcement and permit improved measurement of accomplishments in this field in future censuses.[17] If a way were also found to include some delineation by block or enumeration subdistrict of such environmental factors as inadequate community facilities, excessive land coverage and high density, mixed land use, and natural hazards, it would assist the embryonic tools of urban renewal. It would also facilitate community and national evaluation of whether these new rehabilitation and conservation programs were just patching up or really reshaping neighborhoods.

However, it may be exceedingly difficult for these technical environmental measures to be enumerated accurately in a mass census. A specially trained group of enumerators collecting these data over a longer time period would be required. The full cooperation of city planning agencies would be necessary in order to make full use of basic local data in their files and of informed local judgments. Perhaps these data, if enumerated at all, should only be obtained for those selected problem sections of the urbanized area of special interest to the local housing and planning agencies. The technical nature of these items makes it dubious for Census to enter this field *unless* specifically requested by local redevelopment and renewal agencies. In this event, advisory groups representing the local and federal agencies in this field should be organized.

The Housing and Home Finance Agency would do well to sponsor studies of the survey methods most appropriate and economical for appraising these broader aspects of the housing quality picture. Financial assistance could be provided from advance planning funds and the $5 million demonstration grant program under Section 314 of the 1954 Housing Act to test the utility of full and abridged APHA surveys, experimental enlarged census sample and intercensal surveys, and perhaps other devices. Such measures would aid local agencies involved in the renewal process in decid-

[16] *Ibid.*, p, 57.

[17] For an evaluation of the "Baltimore Plan" of housing law enforcement based on Census data, see Morton Hoffman, "The Role of Government in Influencing Changes in Housing in Baltimore: 1940 to 1950," *Land Economics*, May 1954, pp. 133-135.

ing on the proper treatment for components of the area surveyed, and at the same time perhaps provide a basis for improving future census items on housing quality and environment.

Residential Mobility

The nomad-like quality of the American people in the mid-1950's has become well known. For builders and lending institutions, and developers of new suburbs, this affords an opportunity. For planning and school officials, and private and public housing management, however, high residential mobility has become an increasing problem. For all these groups, mobility information now available from the Census is of limited value. The Census should provide much more information about the relationship of mobility to income, household and housing characteristics. Statistics on mobility, by race and tenure, should be crossed with income, housing quality, family type, family size, age of family head, crowding and doubling up. Such data would permit the detection of mobility patterns, for example, of white and nonwhite low-income renters of substandard housing living under overcrowded conditions, for families of different ages, sizes, and types. Such data, for all income groups, would be of great interest to private real estate management, investment and mortgage-lending institutions, to federal and local housing agencies, and to the varied groups interested in population statistics.

As housing demand is highly sensitive to income changes,[18] mobility based solely on an atypical year of mild economic decline, such as 1949 or 1954, distorts the picture. Moreover, it is likely that many families are "mobility-prone," so that a relatively small proportion of renter families could be accounting for a disproportionate share of annual mobility. These factors suggest that mobility data in terms of recent family history, say number of moves in the last three or five years, would be of greater value than that based on the pattern of only one year.

Finally, it would be interesting to obtain data on mobility intentions, crossed with such items as income, housing quality, family size, and age of family head. Two questions that might be asked are, "Do you wish to move?" and "Do you expect to move within a year?" If such data are feasible to obtain, then a breakdown by tenure would be most meaningful to the analyst of the rental housing market, in view of the findings of a recent study of *Why Families Move* that renters who prefer to own are considerably more mobile than renters preferring to rent.[19] Those skeptical of the worth of a statement of intent should ponder another finding of this pioneering study that ". . . . the actual behavior of the families interviewed conforms closely with their verbalized desires and intentions."[20]

The 1950 Census does report migration data by tracts. These are for individuals, however, whereas the housing items are on a dwelling unit or household basis. This discrepancy hampers severely any comparative analysis of mobility rate by housing characteristics. In the event that the Census Bureau would find it possible to undertake the task of adding some or all of this broadened mobility information on a city-wide basis, in spite of the technical and monetary problems posed, it would be desirable to observe the detailed mobility pattern for

[18] Sherman J. Maisel, "Variables Commonly Ignored in Housing Demand Analysis," *Land Economics*, August 1949, pp. 260-274.

[19] Peter H. Rossi, *Why Families Move, A Study in the Social Psychology of Urban Residential Mobility* (Unpublished study made under a research contract with Housing and Home Finance Agency) 1954, Chap. 5, p. 6.

[20] *Ibid.*, Chap. 6, p. 19.

components of the city, say four or five districts which might be groupings of census tracts, with simpler tabulations for the individual tracts.

Meaningful census data on area and household aspects of mobility would facilitate understanding of and research into the fascinating but relatively unexplored field of residential mobility by workers in the fields of housing, school and city planning, community organization, and all those concerned with real estate markets.

Type of Family

The allusion to possible significant differences in mobility rates among household types stems from the awareness of public housing and social welfare agencies of the increased proportion of broken families in the low-income market. In Baltimore, such families now compose one-third of 6,000 tenant families and an even larger proportion of applicants. In a recent study of attitudes of potential applicants toward public housing, a larger proportion of the broken families than any other group stated they were interested in a place in public housing.[21]

The pioneering family-housing cross-tabulations of the 1950 Census do provide revealing data on the housing conditions of different family groups by tenure. This is an important step forward if one grants that ". . . . housing programs must plan for that part of the urban life cycle where people live in nonnormal families.[22] In Baltimore, "nonnormal" households (that is, all those other than "husband-wife families, no nonrelatives") comprised 45.6 percent of all groups renting substandard housing as against 30.7 percent of those renting standard homes.[23]

"Other family groups, no nonrelatives" consist of the head without a spouse and one or more persons related to the head. This category is made up mostly of "broken" families, and also includes adult families. More precise delineation of the broken family category by the census, followed by its cross-tabulated relationship with several income, population, and housing characteristics, would be extremely useful for private and public agencies in the housing and welfare fields. This applies also to use of the broken family category (and perhaps other family groupings) for measuring doubling up, as additions to the customary use of only "married couples without own household." If the Census Bureau could separate out non-broken family groups from parent-child households (cases where the husband is in the Armed Forces) and from the "other family groups, no nonrelatives" category of the H-B series (adult families), the resulting categories would very closely approximate the broken family concept of housing and social welfare agencies.

Specific Census data on broken families, with meaningful relationships along the lines suggested above, could also open new avenues of research in the fields of social class and structure. Corroboration could be sought, for example, of the observations of sociologist August B. Hollingshead, based on a few community studies, that ". . . . the family cycle is broken prematurely in the working class about twice as frequently as it is in the middle classes . . . . From one-fourth to one-third of working-class

[21] Housing Authority of Baltimore City, *A Study of Attitudes of Potential Applicants Toward Public Housing*, 1954, p. 12.

[22] Harold M. Mayer, "What We Need to Know About the Internal Structure of Cities and Metropolitan Areas," *Needed Urban and Metropolitan Research*, Donald J. Bogue, Editor (Miami, Ohio: Scripps Foundation, 1953), p. 14.

[23] Morton Hoffman, "Substandard Homes in Baltimore: Dwellings and People," *The Councillor*, Baltimore Council of Social Agencies, March 1954, p. 27. for a recent analysis of economic, social and educational factors influencing the formation of "nonnormal" households, see C. Rapkin, L. Winnick and D. M. Blank, *Housing Market Analysis, A Study of Theory and Methods*, Housing and Home Finance Agency, December 1953, pp. 59-60.

families are broken by divorce, desertion, and death . . . ."[24]

Income

The value of the 1950 Census data on income, rent-income, and value-income ratios is greatly diminished by the inclusion of one-person groups. While the 1949 income distribution of families has been published for all major areas, the income of primary families and individuals combined has been used in all the cross-tabulations of housing and family items. The varying proportion of individuals from one tract to the next, particularly in the core areas of central cities, makes it especially regrettable that unrelated individuals were not separated out for the tract distributions.

The financial (and other) characteristics of one-person households are sufficiently different from two-or-more-person households to warrant consideration in future censuses of the separate tabulation of income of two-or-more-person families crossed with other significant items. This is not to suggest that units occupied by one person should be ignored; rather, they should be separated because of the growing importance of the one-person group, and to prevent the characteristics of this group from obscuring trends in the data related to two-or-more-person families.

Family income data for areas smaller than a tract would prove valuable for a variety of purposes. The presence of a few key figures such as the median and percentage of families under $3,000 and over $7,500 would be extremely valuable on a block basis, or for groupings of blocks within a census tract. This need will be increased by the burgeoning programs of urban renewal concerned with very small areas. So many of the existing and embryonic governmental housing programs are tied in with displaced families under the 1954 Housing law that information on incomes of such groups in entire neighborhoods or spot blocks will be avidly sought. In addition to inclusion of these data in the 1960 Census, the necessity may arise of obtaining more current and detailed income distribution of families to be relocated through local surveys or special Census surveys to be paid for by the federal and local agencies involved.

Intercensal Survey

Previous references in this paper to a mid-decade comprehensive housing and population survey make it appropriate to conclude with a plea for such an undertaking. The justification for this might well rest on the poetic description of the nature of large cities by Robert Musil,[25] a little-known but great Austrian writer. Referring to Vienna, he said: "Like all big cities, it consisted of irregularity, change, sliding forward, not keeping in step, collision of things and affairs, and fathomless points of silence in between, of paved ways and wilderness, of one great rhythmic throb and the perpetual discord and dislocation of all opposing rhythms, and as a whole resembled a seething, bubbling fluid in a vessel consisting of the solid material of buildings, laws, regulations, and historical traditions." I don't know what the norm is for seething and bubbling and dislocation for a 5-year period in Austrian or American cities, but urban and rural suburban areas in the United States have certainly been subject to violent pulsations since April 1950. Private and public groups concerned with housing and the simultaneous processes of urban growth and decay have a great need for an inventory-taking

[24] August B. Hollingshead, "Class Differences in Family Stability," in R. Bendix and S. M. Lipset (Editors), *Class Status, and Power* (Glencoe, Illinois: The Free Press, 1953), pp. 290-291.

[25] In his novel, *The Man Without Qualities*, translated from the German by E. Wilkins and E. Kaiser (New York: Coward-McCann Inc.), p. 4.

and measuring point that can only be provided by an intercensal housing survey. Such a survey would also permit the exploration of new concepts, new techniques, and new procedures looking toward an improved job in the next decennial census.

It is regrettable that an appropriation for this purpose failed to pass the 1955 session of the Congress. All users of population and housing census data, whether social scientists or social workers, demographers or marketing specialists, mortgage lenders or government housing agency technicians, interested in obtaining these data for 1956 should see that their respective professional, trade and civic organizations make this interest known to their Congressmen.[26] Strong representations for an intercensal survey —covering all standard metropolitan areas in addition to the country as a whole—could help secure this information so vital to the process of guiding community growth and rebuilding key sections of cities.

[26] See the excellent report of the American Marketing Association submitted to Secretary of Commerce Weeks, Intensive Review Committee on the Census, "An Appraisal of Census Programs for Marketing Uses," *The Journal of Marketing*, April 1954, pp. 331-336.

The Pricing of Special Nuclear Materials

By JOHN VERNON PATRICK, JR.*

THE pricing of special nuclear materials—the atomic fuels from which electricity can be produced[1]—strikingly illustrates the dependence of private nuclear power upon the federal government and the great discretion given the Atomic Energy Commission (AEC). Although it discarded old prohibitions against private ownership of atomic production and utilization facilities, the Atomic Energy Act of 1954 retained a provision giving the AEC title to all special nuclear materials within the United States.[2] Since some special nuclear materials will be produced in power reactors while others, used as fuel, are being consumed,[3] the statutory provisions that the AEC must pay a "fair price" for special nuclear materials produced and make a "reasonable charge" for use of such materials are of vital interest to the industry. An industrial leader in the nuclear power field, Walker L. Cisler, president of the Detroit-Edison Co., has remarked that the value of the Pu-239 (plutonium) or U-233 (a uranium isotope) obtained as a by-product is about the same order of magnitude as the value of the electricity concurrently produced.[4]

These provisions were repeatedly attacked in Congressional debates on the 1954 Act. The minority committee report termed them a "built-in subsidy feature."[5] Senator Gore argued that the fair prices would be unconstitutional unless they were set high enough to provide just compensation, or total production costs, to the most inefficient producer in the United States. Since the Act requires that fair prices be uniform, he feared this would mean vast government commitments.[6] And Senator Morse joined others in decrying the lack of any meaningful standards for the setting of fair prices and reasonable charges.[7]

As the Congressional debates suggested, fair prices, reasonable charges, and subsidies for nuclear power are related problems. Clearly one way of subsidizing the infant industry would be to set high fair prices and low reasonable charges. But are such subsidies necessary, and is this the most appropriate form of subsidy? This paper will examine problems of statutory construction, possible administrative courses of action, and the interdependence of AEC decisions on fair prices, reasonable charges, and subsidies.

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[1] This is also the stuff from which atomic bombs are made. "The term 'special nuclear material' means (1) plutonium, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the Commission, pursuant to the provisions of section 51, determines to be special nuclear material, but does not include source material; or (2) any material artificially enriched by any of the foregoing, but does not include source material." Atomic Energy Act of 1954, § 11(t), 68 Stat. 924, 42 U.S.C.A. § 2014(t) (Supp. 1954). Unless otherwise specified, all statutory references are to the 1954 Act.

[2] *Compare* §§ 41(a), 53(c), 52, 68 Stat. 928, 930, 929, 42 U.S.C.A. §§ 2061(a), 2073(c), 2072 (Supp. 1954), *with old* §§ 4(c), 7(a), 5(a) (2), 60 Stat. 759, 764, 760 (1946).

[3] Pu-239 is produced as a result of the capture of a neutron by U-238; U-233 is produced from a similar capture by Th-232. The capture reaction should not be confused with the fission reaction, in which the atom explodes into fragments when hit by a neutron. See tan 28 *infra*. The fission process generates heat, which may be transformed into electricity.

[4] See 2 *Hearings before the Joint Committee on Atomic Energy on Development, Growth and State of the Atomic Energy Industry*, 84th Cong., 1st Sess., at p. 255 (1955) (hereafter cited as *Hearings on Development*). Mr. Cisler is Chairman of the Management Committee of the Atomic Power Development Associates, representing a group of companies interested in nuclear power. He has long been a proponent of nuclear power. See, *e.g.*, Walker L. Cisler, "Electric Power Systems and Nuclear Power," in *Lectures on Atomic Energy—Industrial and Legal Problems* (Ann Arbor: University of Michigan Law School, 1952), p. 59.

[5] See *H.R. Rep. No. 2181*, 83rd Cong., 2nd Sess., pp. 130-31 (1954).

[6] See 100 *Congressional Record*, p. 10905 (daily ed. July 22, 1954).

[7] See 100 *id.* at pp. 10290-92 (daily ed. July 17, 1954).

I. *Fair Prices*

A. Constitutional Requirements. A novel question is raised by Senator Gore's suggestion that fair prices must provide just compensation to each producer as a constitutional minimum.[8] Since title to the special nuclear material vests in the AEC instantaneously on its production, it would seem that the producer has no "property right" of which he can be deprived, unless it can be argued that the producer owns the material for a split-second, that is, a "scintilla juris," before title passes to the government. However, no more of a constitutional question appears to be presented here than on the revocation of a radio broadcasting license. Presumably the government can constitutionally set reasonable conditions on the privilege of entering this industry, and fair prices may be reasonable although lower than a particular producer's costs. Hence it seems that the producer has no constitutional right to just compensation, and may have recourse only to his statutory rights.

B. Statutory Standards. Section 52 provides that:

"Any person who lawfully produces any special nuclear material, except pursuant to a contract with the Commission under the provisions of section 31 or 41, shall be paid a fair price, determined pursuant to section 56, for producing such material."[9]

What does the term "fair price" mean? Conceivably it might have been intended to have independent substantive significance—for example, it could be construed to require that each producer be paid just compensation, or be allowed a reasonable rate of return (his production costs plus a reasonable profit). However, since section 52 provides that a person owning any interest in material prior to a determination that it is a special nuclear material[10] must be paid "just compensation" while under the same section producers are to be paid a "fair price," it would seem that Congress did not mean to equate the two terms. And "pursuant to section 56" indicates that "fair price" is probably a term whose meaning must be sought within the statute itself, that is, a term of art, as is "special nuclear material."[11]

Section 56 gives the AEC considerable discretion, but little guidance, in fixing fair prices. It simply states that:

"the Commission shall take into consideration the value of the special nuclear material for its intended use by the United States and may give such weight to the actual cost of producing that material as the Commission finds to be equitable."[12]

This section also provides that the Commission may guarantee fair prices up to seven years in advance,[13] and that the fair price shall be paid to all producers of the same material.[14]

"The actual cost of producing" special nuclear material may provide a more concrete standard than the value for its intended use. However, the statutory language does not specify whether cost to government or cost to private producers was intended,[15] although the committee report states that cost to private producers was meant.[16] But the fair price must be uniform: Should the AEC use the cost to the average, to the most efficient, or to the least efficient producer?[17] Because

[8] See note 6 *supra*.

[9] 68 Stat. 930, 42 U.S.C.A. §2072 (Supp. 1954).

[10] *Ibid.*, see note 1 *supra*.

[11] The Act is replete with its own special terminology.

[12] 68 Stat. 931, 42 U.S.C.A. § 2076 (Supp. 1954).

[13] See tan 39 *infra*.

[14] See tan 46 *infra*.

[15] By way of contrast, in fixing a standard for charging users for material consumed, the Act specifies the cost *to the AEC*. See § 53(d)(5), 68 Stat. 931, 42 U.S.C.A. § 2073(d)(5) (Supp. 1954).

[16] See *H.R. Rep. No. 2181*, 83d Cong., 2d Sess., p. 16 (1954),

[17] See 100 *Congressional Record*, p. 10905 (daily ed. July 22. 1954); 100 *id.* at p. 11573 (daily ed. July 26, 1954); 100 *id.* at pp. 11645-46, 11680 (daily ed. July 27, 1954); *H.R. Rep. No. 2181*, 83d Cong., 2d Sess., pp. 130-31 (1954).

this standard is permissive, not mandatory, the more meaningful standard would seem to be the estimated cost to the average producer. Since until now all production facilities have been government-owned, AEC experience furnishes the only cost basis available for setting initial fair prices. But if cost to private producers must be used, AEC production costs should be adjusted to take account of the fact that the government's capital charges are lower than those of private industry.[18]

Regardless of whose costs are to be used, production costs provide a more appropriate standard in fixing a fair price for enriched uranium (*i.e.*, uranium enriched in the isotope U-235) than in fixing fair prices for Pu-239 or U-233. Since enriched uranium is the sole useful product of the gaseous diffusion process by which it is obtained,[19] its costs are easily ascertained. But Pu-239 (or U-233) is only one of the products of the power reactor, and any allocation of costs between the special nuclear material and the electricity produced must be arbitrary.[20] These allocation problems will be further complicated if, as appears likely,[21] gross fission products also become valuable by-products.

The Commission is required to consider "the value of the special nuclear material for its intended use" by the United States. Presumably this provision was designed to allow the AEC to stimulate production of material for nuclear weapons if necessary.[22] Although this standard has been termed the most important factor to be considered in fixing fair prices,[23] arguably it would cease to be of importance once sufficient special material is on hand to satisfy anticipated military needs.[24] Since the material would not be used for military purposes and the Act forbids its use by the AEC to produce electricity for private consumers,[25] its value for any intended use *by the United States* would be negligible. But it seems reasonable to assume that this standard was intended to refer to peaceful as well as military uses.[26] Such a valuation could be based on its fuel value as compared with conventional fuels since the United States would probably "use" the great bulk of the material by renting it out to licensees for use in producing electric power.[27]

Whether used for weapons or fuel, the value of special nuclear materials will vary according to differences in their chemical and nuclear properties. Great purity and a high capacity to undergo fission are desirable both for weapons and for power reactors because they reduce the amount of special material necessary to sustain the fission reaction, thereby reducing the size and weight of the weapons and reactors.[28] Pure U-235, Pu-239, and U-233 are far more valuable than pure U-238 because of higher

[18] See "The Atom: Golden Windfall for Big Business?" *Economic Outlook*, October 1954, pp. 73, 76.

[19] See H. D. Smyth, *Atomic Energy for Military Purposes* (Princeton: Princeton University Press, 1946), pp. 172-205.

[20] Senator Morse proposed an amendment to section 56 which would have required such an allocation. See 100 *Congressional Record*, p. 11573 (daily ed. July 26, 1954).

[21] See H. A. Ohlgren, J. G. Lewis, and M. Welch, "Reprocessing Reactor Fuels," *Nucleonics*, March 1955, pp. 13, 21.

[22] See 1 *Hearings on Development*, p. 76.

[23] See *H.R. Rep. No. 2181*, 83d Cong., 2d Sess., p. 16 (1954).

[24] It has been suggested that this is the reason why recently announced AEC prices were lower than had been expected. See 1 *Hearings on Development*, p. 75; tan 31 *infra*.

[25] See § 44, 68 Stat. 929, 42 U.S.C.A. § 2064 (Supp. 1954). Moreover, AEC demand for electricity for its own use would be lessened by shutdown of its production facilities. At present, the AEC estimates it uses 12.8% of the total national sales of electric power to ultimate consumers. See *Nucleonics*, March 1955, p. 12.

[26] The intended use is not specifically limited to military purposes, and in view of § 1, 68 Stat. 921, 42 U.S.C.A. § 2011 (Supp. 1954), should be broadly construed.

[27] Some might also be used for research, medical therapy, or other applications but nuclear power seems the most important possible peacetime use of special nuclear materials.

[28] See H. D. Smyth, *Atomic Energy for Military Purposes* (Princeton: Princeton University Press, 1946), pp. 35-36.

capacities to undergo fission.[29] But because of the similar chemical properties of the two isotopes of uranium—U-235 and U-238, which are found together in nature—pure U-235 can only be obtained at great cost. Since the source material and the Pu-239 (or U-233) are different elements, pure Pu-239 can be chemically separated out at a comparatively low cost. For example, because it can be more cheaply purified, a 2% concentration of Pu-239 in source material would be far more valuable than a 2% concentration of U-235 mixed with U-238, although if used "as is" they would be about equally valuable.

C. AEC Fair Price Policy. The first AEC schedule of fair prices and reasonable charges was announced on January 10, 1955.[30] Since the schedule was classified as secret information, industry and AEC comments have not been as specific as might be desired for purposes of analysis. Most surprising to industry was the fact that the fair prices were "low." Walker L. Cisler, of Detroit-Edison, stated that they were roughly half what he and his associates had expected.[31] Kenneth D. Nichols, then General Manager of the AEC, testified that these prices were not intended to offer an incentive, or subsidy, for the nuclear power industry although a small amount had been added to some prices because of the potential value of the material for weapons.[32]

The Commission used both the production cost and intended use standards. Apparently fair prices were established for enriched uranium which "have some relationship" to the cost of production in AEC-owned facilities.[33] Then the Commission set fair prices for Pu-239 and U-233 at various concentrations which are proportional to the fair price set for U-235 according to the estimated comparative value of the three isotopes for use as fuel in power reactors.[34] Thus the AEC has apparently concluded that the intended use standard applies to the value for use by licensees of the United States as well as direct use by the United States.[35] This method of fixing fair prices is in line with the criteria for setting reasonable charges for use of special material which, under section 53(d)(3), may be based on "the energy value of the special nuclear material in the particular use for which the license is issued."[36] And it avoids the difficult problems of allocation which would be raised by an attempt to set fair prices for Pu-239 and U-233 based on their production costs.[37]

D. Guaranteed Fair Prices. Possible obsolescence and lack of operating experience are important barriers to the attraction of private risk capital into the nuclear power industry.[38] Section 56 permits the AEC to offset those risks by establishing:

> "guaranteed fair prices for all special nuclear material delivered to the Commission for such period of time as it may deem necessary but not to exceed seven years."[39]

As the industry matures, such long-range commitments may prove unnecessary.

The seven-year limit on the guarantee is a compromise between the desire to encourage the industry and the fear of

[29] *Ibid.* See note 3 *supra*; James A. Lane, "Reducing Nuclear Power Costs," *Nucleonics*, January 1955, p. 24 (estimates pure uranium metal at $20 a lb. and pure plutonium at $20 a gram).

[30] *AEC Sets Schedule of Charges and Prices*, AEC Press Release, No. 590, January 10, 1955.

[31] 2 *Hearings on Development*, pp. 248-49; cf. *Nucleonics*, February 1955, p. 8 ("very, very low").

[32] See 1 *Hearings on Development*, p. 75.

[33] See 1 *Hearings on Development*, pp. 76, 78. But see 2 *id* at pp. 406-07.

[34] See 1 *id.* at pp. 74, 76.

[35] See tan 24 *supra.*

[36] 68 Stat. 930, 42 U.S.C.A. § 2073(d)(3) (Supp. 1954).

[37] See tan 20 *supra.*

[38] See 1 *Hearings on Development*, pp. 156-57, 185-86; tan 73-79 *infra.*

[39] 68 Stat. 932, 42 U.S.C.A. § 2076 (Supp. 1954).

unduly committing the Treasury. Some industry spokesmen have expressed the view that a longer period would be desirable in the present risk state of the industry.[40] However, since changes in technology and in the international situation could significantly affect the value of these materials, the seven-year limit does not seem unreasonable.

Within the period of the initial guarantee, to extend over the full seven years permitted by the Act, the AEC has provided some flexibility by providing a periodic adjustment of guaranteed fair prices if there has been a "substantial" change in the Bureau of Labor Statistics Wholesale Prices Index (excluding farm products and processed foods).[41] Apparently these prices would be adjusted up or down, as appropriate.[42] If so, it might have been better to establish a firm guaranteed price which would protect plant investment in the event of a fall in price levels.[43] But there is some merit to providing a higher return for special materials produced if there has been a rise in operating costs. In an inflationary economy this tie-up with a cost index will be more advantageous than a firm guaranteed fair price.

However, similar flexibility could be obtained by other means open under the statute. For example, the AEC has taken the position that the guaranteed fair price is a minimum which may be exceeded at any given time by the current fair price.[44] Moreover, although the Act does not expressly provide for modification of a guaranteed fair price before its lapse, the legislative history indicates that the AEC may extend a guarantee "at any time" but not to exceed seven years from the extension date; it may raise the guaranteed fair price at any time; and it may set a lower guaranteed price to take effect when an existing guarantee expires.[45]

E. Uniform Applicability of Fair Prices. An important limitation on the AEC's flexibility in setting fair prices is the requirement of section 56 that: "the fair price, as may be determined by the Commission, shall apply to all licensed producers of the same material.[46] It may be arguable that this clause does not limit the Commission's power to set *guaranteed* fair prices. Thus, as we have noted, the AEC has recognized a distinction between a current fair price and the current guaranteed fair price, which is the minimum below which the fair price cannot fall. Moreover, the power to guarantee fair prices for "*all* special nuclear material delivered to the Commission" may simply indicate the full scope of AEC power rather than state a requirement of uniformity. But it would seem that the guaranteed fair price is only one variety of a fair price; it must be determined to be a fair price under the standards established by section 56, and as such it should come within the requirement of section 56 that "the fair price . . . shall apply to all licensed producers of the same material."[47]

F. Producers Not Covered by Section 56. If the purpose of the uniformity requirement is to forbid discrimination among the various producers of the same special nuclear material, that purpose is easily subverted by use of the exceptions to the applicability of section 56.[48] Under section 52, all persons legally producing special nuclear material within the

[40] See 3 *Hearings on Development*, p. 548.

[41] See 1 *id.* at p. 74.

[42] This conclusion has not been made explicit but seems probable from the hearings. *Ibid.*

[43] This problem is an old friend to public utilities: the reproduction cost *vs.* original cost controversy.

[44] See 1 *Hearings on Development*, pp. 75-76.

[45] See *H.R. Rep. No. 2181*, 83d Cong., 2d Sess., p. 16 (1954).

[46] 68 Stat. 932, 42 U.S.C.A. § 2076 (Supp. 1954).

[47] *Ibid.*

[48] See 1 *Hearings on Development*, p. 76. But see tan 52-53 *infra*.

United States are entitled to a section 56 fair price, *except* those producing it "pursuant to a contract with the Commission under the provisions of section 31 or 41."[49] The only portion of section 41 which seems relevant is the provision that the AEC may contract with private industry for production of special nuclear material in AEC-owned reactors.[50] But the scope of the reference to section 31 may be less clear. It might be possible to construe this exception as limited to contracts in which the production of special nuclear material is "pursuant to" a specific contractual obligation; otherwise all contractual relationships would seem included. The reference to section 31 seems sufficiently broad to include research and development contracts in which there is no specific provision covering the production of special material, and in which the production of such material is only incidental to the operation bargained for.

Section 52 apparently contemplates that excepted producers will be compensated under the terms of their contracts. In the absence of such a provision, the courts might hold that no compensation need be paid for any special nuclear materials produced. Hence it would seem prudent, from industry's viewpoint, to specify in the contract the compensation expected for such material. One important problem for the contractor-producer is the length of time over which the AEC may legally obligate itself by contract to pay a specific price. Section 261, which provides that appropriated funds shall remain available for contractual obligations for four years after the year of appropriation, may by implication limit a contractual "guaranteed price" to about four years.[51] Another problem is the amount which the contractor will be paid for producing such material which may legally be higher or lower than the fair price offered under section 56. In practice, the AEC has announced that producers receiving section 31 contractual assistance will be entitled to the same guaranteed fair prices as have been established under section 56.[52]

It should be noted that there is no express statutory authority for the AEC to contract for the production of special nuclear material in privately-owned reactors unless the contract can be brought under section 31. For example, the AEC could make a contract under which it agreed to buy all the special nuclear material produced by a demonstration or research-model reactor at a price higher than it pays producers not under contract. But apparently if it were necessary to secure more special material because of some emergency need, the AEC could not offer a private concern a high price by contracting for production of special nuclear material in non-experimental facilities owned by the contractor. Either the Commission would have to build its own production facilities, which a private concern might operate under a section 41(b) contract, or the AEC would have to offer higher fair price inducements to all producers.

II. *Reasonable Charges*

Under section 53(c) the AEC is authorized to make a "reasonable charge" for the use of special nuclear material.[53] The charge is mandatory for use in section 103 facilities (which have proven commercial value) and permissive for

[49] 68 Stat. 930, 42 U.S.C.A. § 2072 (Supp. 1954).
[50] § 41(b), 68 Stat. 928, 42 U.S.C.A. § 206 (Supp. 1954).
[51] 68 Stat. 960.
[52] See 1 *Hearings on Development*, p. 170.
[53] 68 Stat. 930, 42 U.S.C.A. § 2073(c) (Supp. 1954).

other uses.[54] Thus conventional fuel industries are somewhat protected against competition from subsidized nuclear power[55] although the AEC is permitted to encourage research and development work. As defined by the statute the reasonable charge has two components: the rental, or "use" charge, and the consumption charge. The probable bases for this distinction are the expected long life of the nuclear fuel and variations in the rate of consumption by reactors of different designs.

A. Use Charges. Section 53(d) provides that in fixing a reasonable charge for use of a special nuclear material:

"in addition to consideration of the cost thereof, the Commission shall take into consideration—

(1) the use to be made of the special nuclear material;

(2) the extent to which the use of the special nuclear material will advance the development of the peaceful uses of atomic energy;

(3) the energy value of the special nuclear material in the particular use for which the license is issued;

(4) whether the special nuclear material is to be used in facilities licensed pursuant to section 103 or 104. In this respect, the Commission, shall, insofar as practicable, make uniform, non-discriminatory charges for the use of special nuclear material distributed to facilities licensed pursuant to section 103 . . . ."[56]

Two of these criteria seem designed to help the AEC establish the "value" of the material: the cost to the AEC of the material and the "energy value" test of section 53(d)(3). The other standards seem designed to permit waiver of charges, in part or in full, so as to encourage research, development, and medical applications.

In view of the extent to which these statutory standards depend on the particular use to be made of special material, the AEC might conceivably have announced a separate charge for each use. Instead the Commission announced *standard* reasonable charges, which it may choose to waive in appropriate cases. A two-step procedure was adopted. First, the AEC established a value for each special nuclear material at various concentrations, which it exactly equated with the section 56 fair price for the same material.[57] As shown above, the AEC had used cost of production and comparative energy values to arrive at those fair prices.[58] Second, the AEC announced that it would charge an interest or use charge of 4% annually on the value of the material loaned out.[59] The 4% figure has no special significance; apparently it was a compromise between interest rates currently charged by other government agencies.[60]

One important aspect of the Commission's announcement was the absence of any initial outlay for fuel inventory. Conceivably a deposit equal to the value of the fuel could have been required; there is some indication that industry expected such a requirement.[61] Had that procedure been followed, the statutory standards helpful in determining value (*i.e.*, cost and energy value) would still apply. But no rental charge would be necessary; the government would have the use of the money so deposited and

[54] § 103 facilities must be certified to be commercially "practical" under § 102, 68 Stat. 936, 42 U.S.C.A. § 2132 (Supp. 1954). It may prove difficult to decide just when a particular facility should be certified. See W. Kenneth Davis, *Nuclear Power Industry Development*, AEC Press Release, April 1, 1955, p. 4. Under § 41(a), 68 Stat. 928, 42 U.S.C.A. § 2061(a) (Supp. 1954), facilities for research and development, if they are incapable of producing enough special nuclear material to make a bomb, need not be licensed; otherwise they must be licensed under § 104, 68 Stat. 937, 42 U.S.C.A. § 2134 (Supp. 1954).

[55] For testimony of Brice O'Brien, Assistant Counsel of the National Coal Association, see 3 *Hearings on Development*, pp. 475, 481.

[56] 68 Stat. 930, 42 U.S.C.A. § 2073(d) (Supp. 1954).

[57] See 1 *Hearings on Development*, p. 74.

[58] See tan 33 *supra*.

[59] See 1 *Hearings on Development*, p. 74.

[60] See 1 *id.* at p. 77.

[61] See 3 *id.* at pp. 500-01; 2 *id* at pp. 228, 246 (*semble*).

would be protected against loss of the material by an insolvent licensee. The present procedure seems decidedly more advantageous to industry, since the capital charges on such a fuel inventory would probably be more than 4% in the present risk state of the industry.

B. Consumption Charges. The second component of the reasonable charge is for the special nuclear material consumed by the user. Section 53(d)(5) provides that:

> "with respect to special nuclear material consumed in a facility licensed pursuant to section 103, the Commission shall make a further charge based on the cost to the Commission, as estimated by the Commission, or the average fair price paid for the production of such special nuclear material as determined by section 56, whichever is lower."[62]

This provision is somewhat analogous to the accounting practice of valuing inventory at the lower of cost or market. The language suggests several problems. Are current estimated costs to the AEC or actual past costs of producing the material intended? If past costs, some materials have been consumed;[63] should the AEC take this into account by fifo or or by lifo accounting? The phrase "estimated by the Commission" may be intended to refer to *current* costs[64] but the statute is cloudy on this point. And what is meant by an "average" fair price? Presumably this means an average of fair prices offered for such material over the period of its use in the reactor. But should the AEC use a simple average of the initial and the final price or an average weighted according to the time during which the fair prices were in effect?

By its terms, section 53(d)(5) requires only that section 103 licensees be charged for consumption. Expanding the use of this concept, the AEC has announced that it will require *all* users to pay the standard charges for material consumed.[65] The Commission takes the position that its discretion to make such charges of all users can be implied from section 53(d). Apparently the consumption charges are exactly equal to the section 56 fair prices for the same material.[66]

The amount of material consumed will be calculated after the material has been subjected to any necessary chemical processing.[67] In effect, this means that the licensee must bear the risk of losses in reprocessing even if it is done in government facilities. Moreover, although the question was open under the statute, this announcement means that consumption charges will fall due and fair prices are due *after* any necessary reprocessing. Arguably, periodic payments based on estimated production and burn-up might be more appropriate in view of the fact that the government has legal title to the material when produced or consumed. But the difficulties of estimating production and consumption rates are apparent and the government could not use the material produced until after it has been processed. Moreover, the material produced is of value to the producer in sustaining the fission reaction and the rent which might be charged him for use of this material tends to cancel out the rent he pays on material already consumed.

C. Exceptions from Reasonable Charges. We have noted that sections 52(d)(1), (d)(2), and (d)(4) seem designed to permit the AEC to waive part or all of the standard reasonable charges it has established rather than to aid in setting

[62] 68 Stat. 931, 42 U.S.C.A. § 2073(d)(5) (Supp. 1954).

[63] Primarily by use in weapons.

[64] Presumably actual past costs rather than estimates would be available. Actually estimated *future* values seem to have been used. See 1 *Hearings on Development*, p. 75.

[65] See 1 *id.* at pp. 74, 180.

[66] *Ibid.*

[67] See 1 *id.* at pp. 75-77, 170.

such charges. Section 53(c) suggests some of the same considerations, although it seems to authorize only complete waivers of all charges, by stating that:

"The Commission shall establish criteria in writing for the determination of whether a charge will be made for the use of special nuclear material licensed and distributed . . . . [for research and development work or in medical therapy] . . . · considering, among other things, whether the licensee is a nonprofit or eleemosynary institution and the purposes for which the special nuclear material will be used."[68]

As we have shown, the Commission apparently concluded that it was better administrative procedure to establish standard reasonable charges which might be modified for special uses than to handle every case on a negotiation basis. This step seems sound; it permits industry and other private concerns to make realistic plans for the use of special nuclear material while it leaves the AEC a degree of flexibility. The general, written criteria which seem required by section 53(c) for waiver of use charges have not yet been announced but specific criteria for bids were included in the AEC's recent announcement of its Power Demonstration Reactor Program under which use charges will be waived for up to seven years.[69]

D. Miscellaneous Charges. Under section 161(m) the AEC is authorized to make contracts under which the AEC will perform any required processing or fabrication of special nuclear material and under which the AEC will sell or lease source materials to licensees. These contracts may be "for such periods of time as the Commission may deem necessary or desirable." The section further provides that:

"the Commission shall establish prices to be paid by licensees for material or services to be furnished by the Commission pursuant to this subsection, which prices shall be established on such a nondiscriminatory basis as, in the opinion of the Commission, will provide reasonable compensation to the Government for such material or services and will not discourage the development of sources of supply independent of the Commission."[70]

Pursuant to this authority, the AEC has announced that it will perform at cost all necessary chemical processing, fuel rod fabrication, and other services needed by licensees, to the extent of its present capacity.[71] Because individual job requirements vary, these costs must be individually negotiated with the AEC. For certain standard products such as heavy water and source material, the AEC has included uniform prices in its recently released price schedules along with section 56 fair prices.[72]

III. *Government Subsidies*

A. Are Subsidies Necessary? The wisdom of government subsidization of nuclear power may be open to serious question. So far, there is still doubt as to the extent to which nuclear power will prove to be an economic replacement of old or new fuels.[73] Present-day optimism assumes great advances in technology and operating economies;[74] these may not materialize. In such circumstances, the government might well have left the development of nuclear power to private industry. However, the international situation is such that we cannot afford to lag behind in the development of nuclear power for military uses. Moreover, the develop-

[68] 68 Stat. 930, 42 U.S.C.A. § 2073 (c) (Supp. 1954).

[69] See *AEC Announces Demonstration Program*, AEC Press Release, No. 589, January 10, 1955.

[70] 68 Stat. 950, 42 U.S.C.A. § 2201(m) (Supp. 1954).

[71] See 1 *Hearings on Development*, pp. 74-75.

[72] See *AEC Sets Schedule of Charges and Prices.* AEC Press Release, No. 590, January 10, 1955.

[73] See W. Kenneth Davis, *Nuclear Power Industry Development.* AEC Press Release, April 1, 1955. But see Henry M. Jackson, "The Joint Committee—Something New in Government," in *Lectures on Atomic Energy—Industrial and Legal Problems* (Ann Arbor: University of Michigan Law School, 1952), pp. 241, 248-49.

[74] *Ibid.*

ment of nuclear power for peacetime uses may be of even greater importance in the battle for world leadership and world opinion.[75] Hence government subsidies seem necessary until nuclear power develops to the extent that such aid is unnecessary. During the interim (which may be about 10 years),[76] a serious question faces the government—how shall this aid be given?

The problem is further complicated by the fact that the industries which must take the initial step into the nuclear power field are regulated public utilities.[77] Traditionally, public utility companies have a low-risk, low-return capital structure. If a utility invests in a high-risk industry like nuclear power, it subjects its stockholders to the risk that a utility commission will not include the facility in the rate base on the ground that it was not a prudent investment. And even if allowed in the rate base, utility commissions will probably be reluctant to allow the high rate of return necessary to attract high-risk capital.

So far, state utility commissions have been fairly helpful. Michigan's Public Service Commission has ruled that research expenses may be charged to operating costs (and therefore borne by the consumers).[78] In view of the present incomplete knowledge concerning depreciation and obsolescence it would seem that rapid amortization of capital investments in power reactors will and should be permitted. Similar tax treatment would seem appropriate.[79] If the nuclear power industry receives favorable treatment in these areas, the necessity for AEC assistance may be minimized.

B. Fair Prices and Reasonable Charges. One way in which the nuclear power industry might be stimulated is by means of high guaranteed fair prices for special nuclear material produced and low charges for material and services furnished by the government.[80] In view of the broad discretion given the Commission by section 56, the AEC could easily have taken this route; and there were some expectations on industry's part that this would be the method chosen.[81] But the Commission decided not to offer a fair price incentive on the ground that high fair prices would stimulate operating procedures and reactor designs aimed at producing the artificially overvalued by-product rather than the electricity desired.[82] Moreover, the Commission felt direct aid was preferable to a hidden subsidy.[83]

C. The AEC Power Demonstration Reactor Program. Simultaneous with the release of fair prices offering no incentive, the Commission asked for bids under a new "Power Demonstration Reactor Program."[84] The AEC offered to waive use charges on special nuclear material for a period up to seven years; to make available other materials and services at cost; to perform necessary research free of charge in government laboratories; and to give direct financial assistance under section 31 contracts. April 1, 1955 was the deadline set for the bids which the AEC might reject or accept as it saw fit.

[75] *Ibid.*

[76] Six to ten years appears to be the best present guess as to when nuclear power will become competitive. See 1 *Hearings on Development*, p. 157; 2 *id.* at p. 231; W. Kenneth Davis, *Nuclear Power Development*, AEC Press Release, April 1, 1955.

[77] See 3 *Hearings on Development*, p. 595.

[78] See 2 *id.* at p. 247.

[79] See 1 *id.* at pp. 163-64. When the government built its Pressurized Water Reactor, Duquesne Light Company agreed to build with its own money the turbines, heat-converters, etc., necessary to convert the heat into electricity. Duquesne was subsequently granted an amortization certificate which allowed it to charge off 75% of its costs over a five-year period for federal income tax purposes. Assuming a steady tax-rate, this constituted an interest-free loan of the tax savings. Moreover, the Internal Revenue Service has presumably followed the lead of the utility commissions, and allowed research and engineering work thus far done by research groups to be charged to operating costs.

[80] See tan 7 *supra.*

[81] See tan 31 *supra.*

[82] See 1 *Hearings on Development*, p. 181.

[83] See 1 *id.* at p. 169.

[84] See *AEC Announces Demonstration Program*, AEC Press Release, No. 589, January 10, 1955.

Some Congressmen thought the Commission had been too quick to offer government aid.[85] The Commission rejoined that in its judgment such aid would be necessary for rapid development.[86] Since the bids were to be competitive the AEC felt industry would tend to ask for as little aid as possible.[87] Moreover, since acceptance of such contractual aid will preclude the possibility of securing patents on devices developed during the period of the contract,[88] the AEC felt that industry would avoid government aid unless it was essential.[89] Section 31 assistance is to constitute payment for technical and operating information learned during the construction and operation of the reactors. Moreover, none of the money would be directly used to pay for construction of the reactor which, under section 261, would require specific congressional approval.[90]

The AEC argues that the route it has taken is the most sensible from the viewpoint of the public interest; since the public will receive the benefit of the information obtained, there is no hidden subsidy and there is no undesirable effect on reactor design and operation.

D. Section 169—The No-Subsidy Provision. In recent Joint Committee hearings, Representative Cole[91] and Senator Anderson[92] took the position that the AEC Power Demonstration Reactor Program violated the spirit, if not the letter, of section 169. That section provides that:

"No funds of the Commission shall be employed in the construction or operation of facilities licensed under section 103 or 104 except under contract or other arrangement entered into pursuant to section 31."[93]

Representative Cole contended that the purpose of the section 31 exception had been to allow government research in privately-owned reactors after they were built, not to allow subsidies for construction of power reactors. Although he admitted that the AEC position could be justified under the literal wording of the section, he felt that the "clear legislative intent" had been violated.[94] In response the AEC contended that the exception for section 31 contracts had been regarded not as a "loophole" but as a clear recognition of the AEC's power to give this kind of subsidy.[95] As Senator Anderson suggested,[96] the AEC interpretation may have shifted the emphasis from "no subsidy" to "subsidy." However, the AEC interpretation seems possible and is perhaps the most desirable construction from the viewpoint of public policy. Senator Hickenlooper and Representative Holifield, both members of the Joint Committee, agreed that the AEC construction of the section and course of action had been reasonable.[97] Recent announcements indicate that the AEC will proceed with its program.[98]

IV. *Conclusion*

Putting life and meaning into a statute is a difficult and challenging task. The 1954 Act was susceptible of several possible interpretations, and it gave the AEC

[85] See 1 *Hearings on Development*, pp. 157, 159.
[86] See 1 *id.* at p. 169.
[87] See 3 *id.* at p. 607.
[88] See § 152, 68 Stat. 944, 42 U.S.C.A. § 2182 (Supp. 1954). Although the AEC may waive its claim under any circumstances it deems appropriate, it has not chosen to issue a general waiver to bidders under the Power Demonstration Reactor Program.
[89] See 1 *Hearings on Development*, p. 161.
[90] See 1 *id.* at pp. 187-88; 68 Stat. 960.
[91] Chairman of the Joint Committee at the time of passage of the 1954 Act.
[92] Present Chairman of the Joint Committee.
[93] 68 Stat. 952, 42 U.S.C.A. § 2209 (Supp. 1954).
[94] See 1 *Hearings on Development*, pp. 156-57, 160-61, 173.
[95] See 1 *id.* at p. 160.
[96] See 1 *id.* at pp. 158, 160.
[97] See 1 *id.* at pp. 159-60, 169, 175.
[98] See 3 *id.* at p. 607; *Four Proposals Made to AEC.* AEC Press Release, No. 620, April 7, 1955; *Major Activities in the Atomic Energy Programs*, 18 AEC Semi-Annual Report, pp. 41-43 (1955).

tremendous discretion in areas vitally affecting the nuclear power industry.

All in all, the Commission seems to have acted wisely. The decision to establish standard reasonable charges, for example, seems to be administratively convenient and to enable industry to make long-range plans based on facts rather than on speculation. The policy of subsidizing the new industry through section 31 assistance rather than through artificially high fair prices also has much to commend it. The public is made aware of the fact that subsidies are being given in an area where it is hard for them to know the facts on which fair prices are based, and this method avoids undesirable effects on technology. It may also be less expensive to the public. A technological breakthrough which could make subsidies unnecessary may be closer than we think,[99] making seven-year subsidy commitments by fair prices undesirable.

[99] One such breakthrough apparently occurred prior to November 1954, when the AEC advised interested groups that reactors of very small capacity, 5,000 to 30,000 kilowatts, now seemed economically feasible. Previously, it had been thought that only very large units, 200,000 to 300,000 kilowatts in capacity, would prove competitive. See 2 *Hearings on Development*, p. 408.

Perhaps we should be prepared to see changes in the policies thus far established. Circumstances and personalities on the Commission change. Moreover, pressure by the industry to obtain more favorable treatment is to be expected. It has already been suggested that industry will wait for a time and then press for higher fair prices.[100]

Important policy changes may come from Congress as well as from the AEC. As the needs of the nuclear power industry grow, the importance of military demands for special nuclear materials may be outshadowed. In that event Congress might well relieve the Commission of title to all special nuclear materials and of the responsibility for fixing fair prices for their production and reasonable charges for their use. Just as the 1954 Act reflects a legislative judgment that regulation rather than government ownership is adequate for controlling atomic utilization and production facilities, so Congress might conclude that private ownership of special nuclear materials is consistent with the national security. Prices for special nuclear materials would then be fixed in the marketplace.

[100] *Nucleonics*, February 1955, p. 9.

A Study of Land Ownership by Ethnic Groups from Frontier Times to the Present in a Marginal Farming Area in Minnesota†

By MARIAN DEININGER* *and* DOUGLAS MARSHALL**

I. *Purpose*

THE purpose of this research is to analyze the relationship between ethnic and family backgrounds, distribution of land, length of ownership, frequency of land transfer, and persistence of family residence of people in a rural Minnesota township. Several studies of the relationship between ethnic factors and other variables, such as attitudes toward education, patterns of family relationships, and extent of family farm ownership have been conducted in rural communities of both Minnesota and Wisconsin.[1] The present study, focused on land ownership, has both social and economic implications. It seeks to answer the questions: Are ethnic factors associated with ownership and disposition of land resources? Are ethnic factors associated with continuity of family residence? Are ethnic factors associated with amount of acreage owned? Have these relationships, if they exist, persisted over time? What are the implications of the relationships found?

II. *Selection of Community*

The community selected for this analysis was the rural township of Clearwater in northern Wright County, Minnesota. It was selected because it has had, throughout most of its history, a predominantly Anglo-American population. The Anglo-American represented the first migration of white settlers into many areas of the Midwest, preceding by ten to twenty years the waves of migration from European countries. It thus may be considered, from both chronological and cultural standpoints, something of a "base line" against which further studies of other ethnic groups might be compared.

Table I shows total population figures for Clearwater village and townships by decades over the entire period of the study. Table II shows the breakdown by

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** University of Wisconsin.

[1] James D. Tarver, "Intra-Family Farm Succession Practices," *Rural Sociology*, September 1952, pp. 266-271.

TABLE I—POPULATION BY DECADES, CLEARWATER VILLAGE AND TOWNSHIP: 1860-1950*

	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950[1]
Township	[2]	[2]	440	451	486	455	490	477	456	484
Village	..	..	218	248	271	311	331	212	241	224
TOTAL	240	552	658	699	757	766	821	689	697	708

* Source: *Eighth Through Sixteenth Censuses of the United States*, U. S. Department of Commerce, Bureau of the Census (Washington: U. S. Government Printing Office); 1860 through 1940, "Population" Volumes and Tables.

[1] U. S. Department of Commerce, Bureau of the Census, *1950 Population—Census Report P-A23, Minnesota* (Washington: U. S. Government Printing Office), 1951.

[2] Breakdown into township and village not available in Census data.

ethnic groups from 1860 to 1905, the dates for which these breakdowns are available. Unfortunately, later Census data do not give these breakdowns for villages and townships, but only for county units. Table II clearly establishes the Anglo-American predominance in the community for the first 45 years of its history.

The Anglo-American category covers the broad range of persons who may be regarded on the basis of birthplace as

TABLE II—NUMBER AND PERCENTAGE OF CLEARWATER VILLAGE AND TOWNSHIP POPULATION BY ETHNIC CLASSIFICATION: 1860-1905*

Ethnic Group	Population									
	1860		1870		1880		1895		1905	
	N	%	N	%	N	%	N	%	N	%
Anglo-American[1]	111	46	293	53	369	56	340	50	364	47
Other:	24	10	81	15	123	19	141	21	218	28
Irish	18	...	39	...	46	...	39	...	45	...
German	5	...	25	...	62	...	64	...	75	...
Dutch	0	...	14	...	9	...	5	...	4	...
Swedish	0	...	3	...	1	...	18	...	34	...
Norwegian	0	...	0	...	1	...	14	...	33	...
Other	1	...	0	...	4	...	1	...	27	...
Unknown[2]	105	44	178	32	166	25	195	29	203	25
TOTAL	240	100	552	100	658	100	676	100	785	100

* *Source:* Original Census Tracts, U. S. Census, 1860, 1870, 1880; Minnesota State Census, 1895, 1905; available at Minnesota Historical Society, St. Paul, Minnesota.

[1] Ethnic identification was made by direct interview of descendants and friends, by use of historical documents and census tracts, by surname classification, and was reckoned through the male line. The Anglo-American category (first generally identified by an Anglicized name) includes: (1) "Yankees," defined as native-born persons of native-born parentage whose birthplace and parents' birthplace was in the New England States or upper New York State excluding those of Dutch ancestry; (2) persons who were native-born of native-born parentage from any place in the United States; and (3) persons whose birthplace and parents' birthplace were traceable to the British Isles, excluding Ireland. Subsequent tables isolate "Yankee" landowners—those who trace longer residence in the United States, and whose backgrounds were traceable specifically to New England.

[2] This category actually contains a majority of Anglo-Americans. It was used for those persons who appeared *only* in the tracts for 1860, 1870, or 1895, which gave nativity only as "native" or "foreign." If they were enumerated in 1880 or 1905, exact nativity could be determined, but if not, they were tabulated in this category.

being bearers of a core of Anglo-American culture—migrants from the non-Irish British Isles to the Atlantic seaboard and thence inland to the Midwest. The implications of native or Anglo (British Isles excluding Ireland) birth and parentage dating back from the Clearwater enumerations to somewhere between 1800 and 1845 (allowing 30 years for each of two generations) are apparent. The year 1845 predates the major non-Anglo immigrations to the country. Residence in the United States or Anglo countries as far back as this period warrants the assumption of familiarity with the English language, with processes of self-government, with Protestant religious identifications, with tech-

niques for wresting a livelihood from a new environment, and with pioneer traditions.

While census data on ethnic backgrounds were thus available for only half of the period under study, the figures support the selection of Clearwater as an Anglo-American community. Other methods were employed to establish ethnic identifications for the period 1905 to 1948, and these will be discussed in the following section.

III. *Methods of the Study*

To approach the problems posed for this study, the records of a Wright county abstracting firm were used to trace out the ownership of each tract of land in the township from the date of its first grant to a private owner to 1948—the year the field work was done. The abstract office records also yielded data on family ties. Owners were then checked against Census tracts down to 1905 for identification of their ethnic backgrounds and further family kinship. To cover the period from 1905 to 1948, selected interviews were conducted with long-time residents and decendants of early settlers, from the four major groups—Yankees, Anglo-Americans, Germans, and Irish. A technique of presenting interviewees with complete charts of the ownership of each tract was used which was helpful in facilitating more specific recall of the location of tracts and of the individual owners.

In analyzing transfers of land, a *transfer* was regarded as a change in legal ownership *subsequent* to the first *private* ownership, and thus excludes early transfers between governmental units and between railroad or financial houses in cases of railroad land. Paper transactions, such as deeds to an outside party to establish joint tenancy between husband and wife, were excluded. An *original tract* means a parcel of land as first held by a private owner after acquisition by patent, sale of school or railroad land, etc. *Family* was regarded in the "extended family" sense—the conjugal family plus wider kinship including in-laws, cousins, nieces, nephews. An example of the charts made for each tract of land, the ethnic and family identifications, and the method of counting transfers of land will indicate how the raw data were summarized for each tract. (See Figure 1).

Using these procedures, 232 tracts of land were studied (at one time or another subdivided into 363 parcels of land), involving 2,035 transfers of ownership. Of the 363 tracts and subdivisions, 21 were dropped from subsequent analysis either because they became summer-residences some time during the 92-year period of the study and owners did not represent year-round residents, or because abstract office records had somehow "lost" them. These 21 tracts represent a very small portion of the land area. Of the remaining 342 parcels of land, 92 percent were traced complete with respect to ethnic backgrounds and family relationships of all owners, and 7.6 percent complete enough to use.

IV. *Summary of Findings*

A. *Frequency of Transfer and Subdivision.* In order to appraise the extent of overall subdivision of original tracts of land, and of number of transfers, several averages were computed on the total of 232 original tracts. The original tracts which over the 92-year period were maximally subdivided at various times into 342 parcels of land, yield a ratio of 1.47 subdivided parcels per original tract. Subdivisions may subsequently have been recombined, either as the original tract or in some other combination, but these figures reflect the maximum breakup of tracts since settlement of the township.

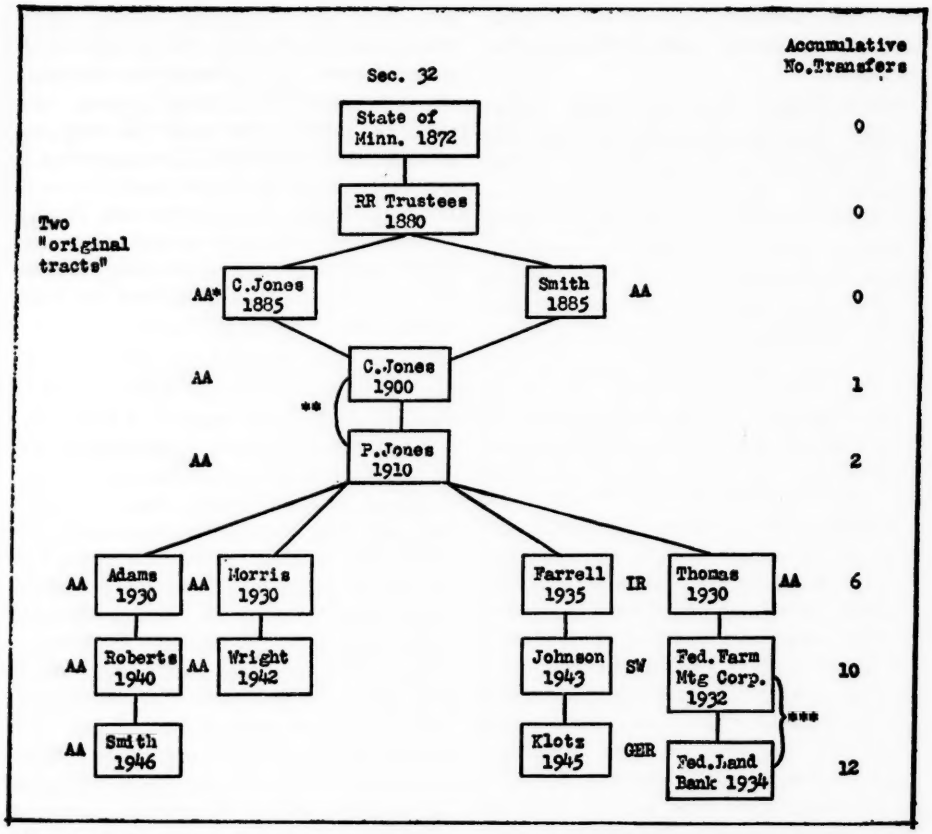

FIGURE I—HYPOTHETICAL EXAMPLE OF LAND CHART SHOWING METHOD USED IN STUDY.

Symbols: * Letters refer to ethnic classifications obtained from census and interview data. AA means Anglo-Americans. IR means Irish. GR means German. SW means Swedish.

** Bracket between owners indicates existence of "extended family" relationship between them.

*** By federal action the Federal Farm Mortgage Corporation became the Federal Land Bank and the change in legal ownership represents a change in a government body, not a transfer of land meaningful for purposes of this study.

The 232 original tracts were involved in 2,035 transfers, an average of 9.7 owners per tract or portion thereof. Dividing the 92-year time span of the study by this average number of owners yields an average of 9.5 years of ownership per tract or portion thereof.

It is difficult to interpret these figures as no other findings are available for comparison. One item which is of some interest in this connection is from a study of "century farms" in Wisconsin.[1] This study analyzed 636 of the 910 farms in Wisconsin which, as of 1948, had been owned by the same family for 100 years or more. These farms were found to have changed hands an average of 2.3 times—a figure which may be compared only in a way with the 9.7 owners of tracts or portions thereof in Clearwater.

The time period of the Wisconsin study is not specified, nor is it uniform for all farms, since the farms were specifically selected on the basis of

ownership by one family line for 100 years or more. Furthermore, the entire state was considered. But the comparison suggests that, when farms are kept in the family, transfer of legal ownership is much less frequent than is the case among all types of ownership found in Clearwater. This observation of course suggests many hypotheses to be explored concerning type and size of farm, type of land resource, geographical location, as well as social factors such as ethnic background of owners, and the effect of these factors on retention of farms by families.

What is the frequency of transfer of tracts subsequent to the original ownership? More than 60 percent of tracts were transferred more than five times over the 92-year period. In the absence of comparative data, several facts about farming history in the Clearwater area may be noted: the soil was light, sandy, required plenty of rainfall and careful husbanding; a single-crop emphasis on wheat was exhausting to the soil, and involved all the market hazards so well known to farmers; diversified practices came late to the area; and arduous labor for its own sake was not an all-pervading cultural value among the predominant Anglo-American group. These factors are certainly relevant to the frequent transfers of Clearwater land. Comparative data from complete townships in richer areas with the same, and different, ethnic concentrations would be needed for conclusive evidence concerning the relationship between the ethnic factor and land retention.

B. *Ethnic Stock of Owners of Tracts and Persistence of Ownership*. Fifty-one percent of all ownerships of tracts were those of Anglo-Americans and Yankees. The influx of Germans in recent years accounts for the second largest number of ownerships—15 percent. Germans have owned almost twice the number of tracts owned by the Irish who had only 8 percent. The latter group arrived around 1880 but steadily declined in numbers after 1900 while the Germans have continued to increase.

Table III shows the changes in ethnic backgrounds of owners between the time of white settlement (1856), and the present (1948). Yankees and Anglo-American owners of land parcels dropped from 63 to 35 percent; the Irish dropped from 12 to 4 percent; but German owners increased from 10 to 32 percent and the "other" category increased from 3 to 20 percent. By 1948 "other" nationality groups consisted chiefly of Swedes and Norwegians with a few Dutch and Russian Mennonites.

These figures reflect the trends found in Census and historical data. Anglo-Americans remain the largest single group but their proportion has dropped

TABLE III—NUMBER OF PARCELS OF LAND EVER SUBDIVIDED, BY ETHNIC STOCK OF ORIGINAL PRIVATE OWNERS, AND OF OWNER IN 1948: CLEARWATER TOWNSHIP

Ethnic Group	Number of parcels as originally owned[1]		Number of parcels as owned in 1948	
	N	%	N	%
Yankee	130	38	58	17
Anglo-American	84	25	62	18
Irish	40	12	13	4
German	36	10	110	32
Other	12	3	69	20
Corporate or state	1	0	21	6
Unknown	39	12	9	3
TOTAL	342	100	342	100

[1] In this tabulation the unit "parcels ever subdivided" (N = 342) is substituted for "original tracts" (N = 232). This is necessary in order that both units and area of land will be comparable for the two dates. By tabulating the entire area of the township in units based on the maximum subdivisions ever made of orginal tracts both subdivisions and re-combinations of land are made comparable for the two dates. This procedure also avoids the necessity of mixed ethnic categories in cases where original tracts are now broken up among owners of different ethnic stocks. It should be emphasized that the land area involved is the same in both this and previous tables.

markedly. The Irish were never very numerous and only a few remain in the community. The Germans have become the second largest group, closely rivaling the Anglo-Americans, and with the scattering of other ethnic groups reflect the change over 92 years in Clearwater's ethnic composition.

C. *Ethnic Stock and Acreage Owned.* Tabulations were also made of the acreage owned by the various ethnic groups. Table IV shows, for 1860 and for 1948, the total acreage owned and the percent of all privately-owned land for each group.

TABLE IV—ACREAGE OWNED, AND PERCENT OF INDIVIDUALLY-OWNED LAND, BY ETHNIC STOCK OF OWNER, 1860 AND 1948: CLEARWATER TOWNSHIP

Ethnic Group	Acres Owned			
	1860	%	1948	%
Yankee	3,910	37.7	2,430	18.0
Anglo-American	3,255	31.4	2,318	17.2
German	420	4.0	5,356	39.6
Irish	691	6.6	435	3.2
Other	160	1.5	2,672	19.8
Unknown	1,956	18.8	292	2.2
Total privately-owned	10,392	100.0	13,503	100.0
State	698	.....	108	.....
State-Railroad	2,632	.....	.....	.....
State-School	497	.....	.....	.....
Corporation	.....	.....	608	.....
TOTAL ACRES	14,219	.....	14,219	.....

As with number of parcels the shift in acreage owned by ethnic groups is striking. Yankee and Anglo-American acreage dropped from 69 percent of all privately-owned land in 1860 to 35 percent in 1948 while German acreage increased from 4 to 40 percent. The limited Irish holdings in 1860, 7 percent of all privately-owned land, dropped to 3 percent in 1948. A separate tabulation for 1900 showed an increase for this group to 9 percent, reflecting the peak of Irish ownership toward the turn of the century. Other nationalities paralleled the German increase—from 2 percent in 1860 to 20 percent in 1948.

The large acreage appearing in the "unknown" category in 1860 reflects the considerable amount of land speculation characteristic of Clearwater and of many pioneer communities in the Midwest. People could come into an area, claim or buy land, sell out and move on within a year, or even a few months. Land could be claimed in the name of a relative who never appeared on the scene. These practices resulted in many recorded title holders whose names neither appeared in Census enumerations nor were ever known to residents, and interview-informants were unable to provide any information about them.

In order to analyze change over the time span of this study the period was divided into three segments of thirty years each to try to represent some socially meaningful time period, i.e., three generations of thirty years each. Dates selected for cutoff were 1858, 1888, 1918, and 1948. The year 1858, two years after the plat and organization of Clearwater village, was selected because it was also the year the township was platted although many township and claims and residences had been established before the actual township plat. It is a feasible beginning date early in Clearwater's history but one which had already seen many oldtimer families established as land owners.

Incidentally, it was immediately apparent after the independent selection on historical grounds of the base year, 1858, that the three succeeding generation demarcations—1888, 1918, and 1948—coincided very well with certain important phases of Clearwater's history. The year 1888 was during the height of economic development in agriculture, lumbering, and trade, and of community social activity. It saw the influx of the Irish

group, along with a few Germans. The next date, 1918, coincided approximately with evidences of a decline in Clearwater's fortunes. It saw a decrease in the number of Irish residents and the attainment of an established position by the Germans. The terminal date, 1948, in addition to being the date of field work, was characterized by some distinct signs of rebirth in community activities, some efforts to revive trade based on agricultural gains and to bridge ethnic gaps in the interest of the whole community.

Table V shows the acreage owned by each ethnic group and percentages of all privately-owned land for the dates marking the three generations. The long-term

TABLE V—Acreage Owned and Percentage of Privately Owned Land, by Ethnic Stock of Owner, Over Three Generations: Clearwater Township

Ethnic Stock of Owner	Acres Owned							
	1858	%	1888	%	1918	%	1948	%
Yankee	3,650	42.3	4,593	36.9	3,339	23.9	2,384	17.8
Anglo-American	2,236	26.1	4,186	33.7	3,719	26.6	2,442	18.2
German	260	3.0	1,298	10.4	3,649	26.1	5,266	39.4
Irish	665	7.7	1,395	11.2	642	4.6	300	2.2
Other	.....	.....	200	1.6	2,038	14.6	2,568	19.2
Unknown	1,797	20.9	768	6.2	594	4.2	438	3.2
Total privately-owned	8,608	100.0	12,440	100.0	13,981	100.0	13,398	100.0
State and corporation-owned	5,414	.....	1,622	.....	147	.....	691	.....
TOTAL ACRES[1]	14,022	.....	14,062	.....	14,128	.....	14,089	.....

[1] Total acreage for each date varies by less than 1% (1918) over 1858 total, due to errors in hand tabulation of land owned throughout numerous subdivisions over the four dates, incompleteness of acreage stipulations in land records, and difficulties in interpreting plats at various dates. Since the error is so small, checking of the entire tabulation by hand was not deemed necessary.

trends previously noted are confirmed in Table V. Figures for successive generations indicate these changes in land ownership as they are related to cycles of family life.

Over the first generation, combined Yankee and Anglo-American land holdings increased and attained 70 percent of all privately-owned land. The peak of Irish land holding appeared in 1888 and German holdings were increased rapidly.

The second generation saw the downward trend of Yankee and Anglo-American acreage and percentages, a drop of 50 percent in Irish holdings, and a great increase in the German and "other" ethnic group concentrations.

The third generation was characterized by the rise to first place of German acreage, amounting to 39 percent of all privately owned land. Combined Yankee and Anglo-American holdings had dropped to 36 percent. Irish holdings were at their lowest for the entire period and the "other" category reached 19 percent. Germans and "others" together held 59 percent of all privately-owned land, considerably more than the combined Yankee and Anglo-American acreage.

An interesting fact is that, despite this evidence of reduced control of the land as of 1948 by the Yankee-Anglo-American group, they still retain a striking amount of social influence in the community. Strong political and economic influences, as well as social prestige and effective control in formal social organizations, are still retained by this group.

The data in Table V reflect a lack of opportunity for succeeding generations of Clearwater residents. The first generation engaged in a wide range of pioneer enterprises with an increasing amount of land becoming available for private ownership. The second generation saw only 1,500 additional acres pass into the hands of private owners and toward its close Clearwater passed the peak of its growth cycle. Enterprises supplementing agriculture declined. Opportunities for sons and daughters of Anglo settlers were fading—in agriculture, lumbering, milling, and trade. The third generation found available agricultural and stabilized, non-agricultural enterprises further declining, and a marked displacement of Anglo-Americans by Germans. This was the generation during which land reclamation practices were being emphasized throughout the nation but many sons and grandsons of Anglo-Americans were gone from Clearwater and new, younger families of Germans acquired increasing amounts of land.

D. *Ethnic Background and Extent of Intra-Family Land Transfers.* Of the entire 2,267 ownerships of tracts, 1,009 or 44 percent, were acquired from or sold to extended family kin. Some thirteen tracts passed through six intra-family owners, six through seven owners, and one tract was transferred within a family eight times. It should be noted again that these transfers represent changes in legal ownership and thus include all reductions or distributions of ownership among multiple heirs. It was necessary to define "family" as the extended kin-group because the legal status of property often involves fractional ownership among heirs to an estate for considerable periods of time. In some instances twenty to thirty years elapsed before one individual obtained sole title to an estate. It would have been hopelessly complicated to tabulate fractional ownership by number of years owned by each heir. Thus the extended family concept was used and does reflect the effort to keep land in a family as well as the presence of kin to make this practice possible.

Of the 1,009 intra-family ownerships, 702 or 70 percent were for periods of 15 years or less. Yankees and Anglo-Americans held the largest number of both long-time and short-time ownerships, reflecting both the persistence of this group in Clearwater, as well as the early settlers' land speculation practices and frequent selling out of holdings. Three Yankees and two Germans held single ownerships 60 years or more.[2]

Table VI shows the number of years of continuous family ownerships by ethnic groups. About half of all continuous family holdings were for periods of 30 years or less with the Irish holdings in this short-time category rising to 60 percent. Yankees, Anglo-Americans, and the "other" ethnic groups held some 40 percent each of the continuous ownerships of between 31 and 60 years. Yankees, Anglo-Americans, and Germans held most of the long-time ownerships. Two German families settled in the township early and their holdings constituted most of the long-time ownerships

[2] A study of turnover in the Kansas farm population published in 1935 reported that eight percent was the highest proportion for any township of settlers of 1860 whose descendants in the male line still remained as farm operators. J. C. Malin, "The Turnover of Farm Population in Kansas," *The Kansas Historical Quarterly*, November 1935, pp. 339-372, quoted in Carter Goodrich, et al, *Migration and Economic Opportunity* (Philadelphia: University of Pennsylvania Press, 1936).

TABLE VI—YEARS OF CONTINUOUS FAMILY OWNERSHIP BY ETHNIC GROUPS: CLEARWATER TOWNSHIP, 1856-1948

Years Owned	Number of Family Ownership													
	Yankee	%	Anglo-Am.	%	German	%	Irish	%	Other	%	Unknown	%	N	Total %
0-30	50	40	46	43	24	49	21	60	14	52	20	100	175	48
31-60	51	41	46	43	18	37	12	34	12	44	..	..	139	38
61 +	24	19	15	14	7	14	2	6	1	4	..	..	49	14
TOTAL.....	125	100	107	100	49	100	35	100	27	100	20	100	363	100

for this group. Continuous family holdings thus parallel findings from previous tabulations in reflecting Clearwater's history. Yankees and Anglo-Americans were both short-time and long-time residents; later comers—Germans and Irish—had very few long-time residents, although more Germans were long-time owners than Irish and the Irish were predominantly short-term owners.

Table VII, showing number of intra-family ownerships occurring in each of the three generations by ethnic groups, reveals similar trends. Yankee and Anglo-American families have been displaced somewhat by Germans and "other" ethnic groups; the Yankee decline reached 13 percent over the three periods. Germans and "others" have steadily increased, while Irish family owners rose from 9 to 11 percent and then dropped back to 9 percent over the 90 years. The figures for the three periods, as approximations to phases in a family cycle, show that, with the total number of intra-family ownerships relatively stabilized after the middle period, the ethnic displacement previously noted is also reflected in each generation of residents.

TABLE VII—NUMBER OF INTRA-FAMILY OWNERSHIP IN THREE THIRTY-YEAR PERIODS BY ETHNIC GROUP OF OWNERS: CLEARWATER TOWNSHIP

Ethnic Group	1858–1888		1888–1918		1918–1948	
	N	%	N	%	N	%
Yankee.....	91	44	86	33	59	31
Anglo-American.....	70	34	78	30	53	28
German.....	15	7	39	15	38	20
Irish.....	18	9	28	11	18	9
Other.....	2	1	21	8	24	12
Unknown.....	11	5	9	3		
TOTAL.....	207	100	261	100	192	100

V. *Summary and Conclusions*

A. *Substantive.* This study has examined legal land records to find out whether any relationships exist between the factor of ethnic background and number of tracts of land owned, length of ownership, total acreage owned, and extent of intra-family transfer and ownership of land. Data were analyzed on these variables for an entire township in rural Minnesota populated by a majority of Yankees and Anglo-Americans throughout most of its 92-year history of white settlement. To briefly summarize the findings we would say: (1) Comparison with data of only one other relevant study indicates Clearwater land was involved in relatively frequent transfers. (2) Ranking of ethnic groups on number of tract ownerships parallels that based on population concentrations for the first fifty years of the period: Yankees and Anglo-Americans ranked first, Germans ranked second, and Irish ranked third. (3) Comparison of number of land parcels originally owned with those owned at the end of the period studied shows Yankees and Anglo-Ameri-

cans owned the largest percentage for both dates in spite of a decline of almost 50 percent; those owned by Germans and "others" have increased greatly while the number of Irish-owned parcels has greatly declined. (4) Comparison of acreage owned in 1860 with that owned in 1948 parallels findings for land parcels owned except that, by the latter date, German-owned acreage had surpassed that of the combined Yankee and Anglo-Americans by a small margin. (5) Comparison of acreage owned by the various nationality groups over three thirty-year generations also follows the trends noted in (4) and reflects changing ethnic concentrations which coincide with phases in the social and economic cycle of the community. (6) Analysis of length of time families retained land among their kin revealed general similarity among the Yankees, Anglo-American, and German groups, while more Irish intra-family ownerships extended over a brief time span. Clearwater families seem to have stayed on the land considerably longer than one study reported for farmers in Kansas.

These findings show how land acquisition and retention varied for Clearwater township among three major ethnic groups—how an original group acquired most of the land and then how two successive waves of newcomers from two other ethnic groups displaced about half of the old-timers. They reflect the shifts in land ownership accompanying phases in the cycle of community growth and decline. The changes in ethnic concentrations over time reflect differential values about farming. Yankees and Anglo-Americans wanted quick prosperity and they rapidly exhausted a marginal soil by their one-crop emphasis. An increasing number of Germans moved in during the "era of reconstruction" when diversification, soil rebuilding and conservation practices were being recognized on a nation-wide scale.

B. *Methodological.* A few observations may be made in conclusion with respect to implications of the methods of this study. In the first place, the method furnished something approaching an estimate of the population distribution by ethnic backgrounds for the years since 1905 when ethnic breakdowns for township units from Census tabulations became unavailable.

In the second place, the quite extensive knowledge gained about residents by charting each owner of all original tracts of land is of real benefit to the researcher making a longitudinal community study. People's names, their family members and relatives, location of particular land parcels, and bits of historical information gained from records of wills, boundary disputes—all such details provide the investigator with insights and general familiarity with the community that are invaluable when interviews with present-day residents are conducted. They often lend background to items in newspapers and other sources of historical data.

In the third place, it must be noted that greater value would accrue to this study if similar data for other townships were available for comparison. Townships selected with various factors controlled, such as land area, type of farming, soil resources, date of white settlement, etc., and with ethnic concentrations varying, would enhance appraisal of the persistence of differential ethnic characteristics. Study of other predominantly Anglo-American communities would be important to confirm or refute trends found in Clearwater.

In the fourth place, the use of IBM procedures would greatly facilitate analysis and might make possible a longitudinal study of land ownership according to operating farm units.

Mechanics of the Urban Economic Base: Causes and Effects of Change in the Base Ratios and the Base Ratio Elements (III)

By RICHARD B. ANDREWS*

Editor's Note: *Over a period which began with the May 1953 issue of LAND ECONOMICS, and continuing in consecutive issues, a series of articles written by Richard B. Andrews under the general title of "Mechanics of the Urban Economic Base" has been published in this magazine. Beginning with an historical examination of the base concept, description and criticism has proceeded through the technical phases of terminology, classification, identification, measure, geographical delimitation, and static ratio theory. This article is the last in a subseries of three articles concerned with the dynamic aspects of the urban economic base ratios. The objective of this subseries has been to describe the concept of the base ratios in movement and to criticize both the reality of this interpretation of the urban economic scene and its utility for the practising city planner.*

THIS article reemphasizes the contention of the one immediately preceding it that an understanding of the dynamic aspects of the urban economic base ratios is necessary to the planner before he can use this particular concept as a tool of estimation and control.[1]

In examining the dynamic aspects of the base ratios the plan has been to state and criticize the explicit and implicit theories of the ratios and their elements in movement. A large part of the criticism is concerned with the shortcomings and qualifications of present theory. Criticism is extended, however, to the point of rough theory revision subject to further organization, refinement, and, of course, testing.[2]

Previous analysis concentrated on the traditional approach of base ratio dynamics theory which maintains that the economic base is the strategic factor controlling the nature of change in all the other elements. This theory was examined under assumptions of increasing and decreasing size and qualitative change in the base element.

The present article departs from the path of established theory and looks at the character of change within the ratios when the base remains quantitatively constant. This approach suggests the importance of exploring the potentialities of independent change in ratio elements other than the base. General consideration is also devoted to the influences of industrial linkages and complementary relationships within the urban economy over the nature of ratio relationships and change.

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[1] The urban economic base is composed of those parts of an urban economy which sell or give their goods, services, or capital to persons or organizations whose source of payment and, usually, residence lies outside the boundaries of the urban economic base area under analysis. In the role of economic complement to the base are service activities which sell or give their goods, services, or capital to persons or organizations whose source of payment and residence is within the base area. There are relatively few examples within an economic community of firms that are purely base or purely service. On a firm basis the typical situation is one in which a mixture of base and service activities within a firm prevails.

[2] A typical base ratio pattern with an employment measure appears as follows:

B	:	S	: :	1	:	1
B	:	TE	: :	1	:	2
TE	:	TP	: :	1	:	2
B	:	TP	: :	1	:	4

The symbols used are: B, base employment; S, service employment; TE, B plus S, or total employment; TP, total community population. Base ratio dynamics theory in essence states that as quantitative changes, positive or negative, take place in B the other elements will in the short run remain relatively constant. As a result a different pattern of ratios will develop. However, in the long run, changes will take place in the other elements with exception of TE, proportional to those which occurred in B. Thus according to theory the original ratio pattern is restored.

Independent Changes in S, B Remaining Constant

An implicit assumption of the base ratio concept is that changes in all elements of the ratios stem from B. While there is no doubt in the mind of this writer that B does hold the key position within the ratio pattern he believes that the other elements have power of independent change which are of great importance to an individual urban economy, and to the economic investigations of city planners.

For the purposes of limiting this discussion to relatively pure examples of independent change on the part of S, TE, and TP it will be assumed that B remains relatively constant in a qualitative as well as a quantitative sense.

Conditions in which S is likely to show its power of independent change while not numerous are important to note. The most familiar of these conditions is the one in which real incomes of base area families increase. Cause for such an increase may lie in one or a combination of factors including higher productivity brought about by mechanization and /or increased labor efficiency which is recognized by wage and salary rewards, favorable over-all price shifts, increases in income traceable to corporate policy, union action and the like.[3] Increases in real incomes will in the low- and middle-income ranges be devoted heavily to expenditures on goods and personal services dispensed by S thus stimulating employment and the opening of firms in that category of the urban economy. However, interesting repercussions can develop from upward shifts in real income that do not follow quite the same simple pattern just described. For example, an increase in total expenditure of consumer dollars in a community will often act as a stimulus to the formation of types of service establishments which up until that time would not have had sufficient patronage to justify operation. Much the same effect may be traced to changes that are likely to take place in consumers' tastes when their real incomes rise. The fact that there does not appear to be a constant ratio between total employment (B + S) and total wages and salaries indicates yet another direction in which income changes may represent a source of independent employment growth particularly within S. It has been observed that:

> "As more firms locate in the city the labor market becomes more competitive which . . . . means that wages and salaries are higher than under the formerly monopsonistic or oligopsonistic conditions.
>
> "The growth of individual firms permits economies of scale and consequently a higher marginal revenue product than formerly which in turn means a higher wage. Large scale firms in the city also mean the presence of highly paid administrative and executive personnel."[4]

The conclusion to be drawn from the above reference is that the income situations described are productive of further employment growth in S via increase in total disposable income available for patronage of S firms.

In the process of community evolution the locational trend of the investment of locally saved funds has a bearing on the independent expansion of S. There are at least two important aspects to this particular phase of urban economic change. In the early stages of community growth local savings are directed heavily into "foreign" or external investments as well as into local base enterprises. However, as the community grows in areal

[3] Cincinnati City Planning Commission, *Economy of the Area* (Cincinnati, Ohio: 1946), p. 23.

[4] B. G. Jones, *A City Planning Oriented Economic Model*, an unpublished master's thesis, University of North Carolina, Chapel Hill, 1954, pp. 46-47. This thesis presents many challenging concepts for the base analyst in its application of economic theory to the elements of the base ratios.

and population size and as service enterprises become proportionately more numerous and of larger unit size there occurs a proportionate increase in the flow of local investment funds into S. In effect, therefore, a proportional decline in a portion of B may develop as savings are diverted from external to internal investment. This greater availability of local capital on the secular trend is, consequently, a partial explanation for the gradual proportional increase of S in the ratios.

In many urban areas there may exist service enterprises which are under-producing goods and services. As a consequence the balance of local needs in these particular lines is imported. Either by formal public promotion or the informal and more gradual attraction of factor-prices and profits, output and employment of S may be expanded independently and as a consequence reduce an import leakage of the community.[5]

Other circumstances which may cause S to increase independently of B include those long-run secular influences which reflect the development of the national culture and the local economy. Here come into play such general factors as shortening of the work day, increasing volume of double earners in the family, pressure of national advertising and the growth of local population to a point where patronage minimums necessary to entry for certain specialized S activities are satisfied. The local economy will evolve, if it is well endowed in locational resources, through early stages of frontier development, rural area distribution, to manufacturing, regional and international distribution and administration. There will, of course, be specialized base variations of this evolutionary trend. Throughout the course of this development S will tend to increase the weight of its proportion in the ratios. In a sense this type of change in S is attributable to qualitative evolution of B but has a sufficiently respectable degree of independent movement to warrant comment. Changes of the type just described usually span such a long period of time that their implications are fairly clear to the planner.

The service portion of the urban economy may go through yet another phase of evolution. This involves a situation in which S begins to contribute directly to the growth of B. There appear to be two general circumstances in which this occurs. One is the result of long-term evolutionary growth of the community in terms of population size and economic strength which witnesses the attraction of a substantial export trade to S firms that had started their lives as purely local operations. The other circumstance in which S is likely to make a contribution to B is that in which individual S firms mature rapidly due to efficient management or other internal factors thus developing a respectable volume of export sales. (The reverse of this argument with B in transition was referred to in the preceding article in this series.)

Independent shifts of S in a negative direction when B is constant are not as familiar as the positive movements just discussed. However, an example or two of negative movement conditions will perhaps suffice to show the characteristic circumstances in which this situation occurs.

In Memphis during World War II rapidly rising real incomes were enjoyed for the first time by the principal wage earners of many Negro families. As a consequence wives and daughters in these families were frequently able to give up their positions in domestic service. Substantial cuts in the volume

[5] Cincinnati City Planning Commission, *op. cit.*, pp. 23-24.

of domestic servants contributed to a reduction in the size and the proportional relationship of S in the ratios.[6] Following the war, S may not have regained its full strength once more at least through the domestic service field. This might develop because of evolving attitudes toward occupational status and racial equality. A situation of this sort is rather specialized but does tend to show the possibilities of independent movement that lie in S. Here again it may with cause be said that the seed of change lay in B. But the change in B here involved is not of the long-term quantitative or qualitative sort around which the assumptions of this discussion revolve.

Negative independent movements of S can also be explained by inter-community competition among service establishments. Local trade may be attracted away from the subject community to a neighboring community on the basis of any number of competitive issues. Of course, one could also argue that S would have similar independent power of growth by pulling patrons from outside the area. However, trade so gained would be B not S. This aspect of change in S relative to B would, of course, be of great community importance.

Changes in marketing techniques could easily influence S negatively from an employment point of view. Extensive self-service operations combined with a consolidation of many small distributors into a few large establishments would be a generalized example of this situation. However, increased productivity and profits might ultimately counterbalance this condition. Changes in the savings habits of the families of a community can also cause S to fall or rise independently of shifts in B. A substantial and sustained increase in the proportion of investment savings taken from expendable income within a community may reduce the volume of employment and number of firms in S. This situation will develop through the decline in patronage of S that will accompany an increase in savings with possible counterbalancing effects from increasing consumer installment credit. Conversely, of course, an extended decline of the proportion of income saved (B and the distribution of incomes remaining substantially the same) can lead to a rise in the ratio size of S.

Another institutional factor which should be taken into account in gauging the possibility of independent negative movements of S is to be found in local business credit policies on long-term construction and equipment as well as short-term inventory loans. Tightening of terms on an indefinite basis may have a weakening influence over S that will cause portions of it to decline competitively with neighboring communities. As with savings a converse policy may have opposite effects.

In concluding these comments on the independent movements of S, mention should be made of the question of the relative importance of B and S. Too often it is taken for granted that B is the more important of the two in an urban economy. In general this is true. But the planner must not lose sight of the fact that from both a dollar volume and employment point of view S frequently carries greater weight than B. S, moreover, usually involves a far greater number of individual firms and proprietors than does B. Consequently, in guiding his economy the planner must give more attention than he has in the past to the service element. Zoning, traffic, and parking plans are a part of this concern but too often are not con-

[6] National Housing Agency, *Housing Market Analysis, Memphis, Tennessee* (Housing Market Service: Washington, D. C., June 1944).

ceived with the specific idea of preserving and promoting S as the companion cog of the city economy. An increasing recognition of the fact that S has power of independent change and that, consequently, there may occur important changes in the volume and price of goods and personal services provided by S directly to the production side of B, perhaps will bring the community-economy aspects of S into more meaningful focus for the planner.

Independent Changes in TP and TE, B Remaining Constant

In special situations such as those involving the base of a central city satellite unusual ratio element relationships can develop. For example, B in Brockton, Massachusetts might remain constant but TP could decline in the event that more and more of the employees in B commuted from Boston, or shifted their residence but not their jobs from Brockton to Boston.[7] In other situations involving non-satellite base areas, however the base area boundaries would follow the commuters and no change in TP would be evident.

A situation which is not at all uncommon is one in which TP may rise sharply in an area as a result of in-migration from depressed areas or in-migrations for health reasons. In the first situation migration is not in response to demand on the part of an increasing B but to lack of opportunity in the area evacuated. Some savings in the hands of the migrants would undoubtedly be a stimulus to S but B, at least in terms of employment, would be unaffected. The permanence of such an addition to TP would depend upon the dynamic qualities of B and then of S to absorb the migrants as employees once their savings were exhausted. Ultimate absorption of the population increase by B and S would see these elements moving into a third-stage ratio adjustment with TP.[8]

Long-run social change can also bring about relatively independent shifts in TP. Positive or negative changes in birth rate and family size can occur within a community over the years—which are prompted by customs and tastes not directly associated with activity in B.

Whereas TE is the sum of B and S the ratio relation of this factor to TP does undergo relatively independent changes over time. These long-run shifts are in part a reflection of the developing local economy but more specifically are a response to the evolving social characteristics and customs of the population. In the early stages of its history a community may have a very high TE:TP ratio, in some cases due to the heavy pioneering nature of the industries of that period and the consequent presence of many young, single males in the population. As population growth and expansion in the proportionate number of families takes place this ratio is likely to decline. Over time, increases or decreases in the TE:TP ratio will occur as a result of entry of women into the labor force, lengthening of the educational training period and the like. Retirement policy would also be a factor if retired persons were discounted from the base and only active employees considered in TE. Ideas of this kind in the field of dynamics, while not easily gauged, work much

[7] This line of reasoning assumes that employees from outside the base area are counted as a part of the employment total of B. Some analysts may not consider them in this relation when only local ratios are being considered.

[8] A situation with some of the characteristics here described was reported in Albuquerque, New Mexico. Large numbers of migrants, a few with independent means, have gravitated to this community for the purpose of improving their health. (See Federal Reserve Bank of Kansas City, Missouri, *The Economy of Albuquerque, New Mexico*, 1949, p. 38.) Here again limitation of the ratio concept to an employment measure confuses the reasoning somewhat. Actually the savings of the in-migrants represent a part of B and hence an increase in that element which will logically bring forth an increase in S.

more slowly than most others discussed in this paper and are so much more familiar to the planner that they are not stressed in any detail here.

The Position of Linkage in Base Ratio Element Dynamics

The preceding article made reference to the general nature of the "chain reactions" that may be expected within S when B is rising or falling. Internal adjustments of S were usually changes in the direction of third-stage equilibrium. However, no mention has been made thus far in these discussions of the internal reactions of B to positive or negative shifts within that element. A somewhat oversimplified assumption was at least implied that positive or negative changes in B were confined to a single firm or firms producing the same line of goods or services and that no other parts of B were affected by the change in the employment and output of these firms. It is, therefore, the purpose here to explore briefly the nature of these reactions. The discussion will necessarily be brief and at a broad conceptual level because very little is known about this variety of interaction.[9]

The importance of an approach such as this to the subject of ratio element dynamics is great. This is due to the fact that the quantitative and qualitative changes which occur in B are, as this series has been demonstrating, the key, though not exclusive, influence over changes in the other elements. Consequently, the planner must strive toward a more complete understanding of the economic ramifications of a change in one part of B, first because of its possible effects on the balance of B, and second because of the combined effects of these changes in B on the other ratio elements.

Many change interactions within B are perhaps best explained by the term "linkage," although the expression is customarily associated with manufacturing plants which may or may not be located in the same community. These plants work closely together in the process of production usually in respect to the flow of parts or semi-finished goods from one to the other. There is also an undoubted implication here that linking means a restricted or specialized market in respect to sale by one plant and purchase by the other. Linkage for purposes of a discussion on base ratio dynamics must, however, have a broader and yet more precise definition. Linkage in the ordinary sense appears to be confined to manufacturing. What about other industrial activities? There is also a substantial question as to when linkage exists. The general outlines of this difficulty were emphasized in the article of this series which treated base identification.[10] Does it involve goods alone or are services and capital a part of the concept? Is a firm considered "linked" when a major portion of its output goes to another firm or firms in the base area? Or must all of its output be absorbed by the other firm or firms? Admittedly questions of this sort need more definite answers before one can proceed very far with a discussion of linkage. However, they have as yet not been so answered and as a consequence only broad statements on the subject can at present be made.

From a simplified point of view let us consider a direct linking to be one such as might exist between a starter plant and

[9] The theoretical and empirical urban studies of Walter Isard and his colleagues employing the input-output concept developed by W. Leontief indicate very real possibilities for working out a theoretical framework for this particular phase of internal change in B. See particularly, W. Isard and V. Whitney, "Atomic Power and Regional Development," *Bulletin of the Atomic Scientists*, April 1952, also W. Isard, R. Kavesh and R. Kuenne, "The Economic Base and Structure of the Urban-Metropolitan Region," *American Sociological Review*, June 1953.

[10] Richard B. Andrews, "Mechanics of the Urban Economic Base: Special Problems of Base Identification," *Land Economics*, August 1954.

an automobile manufacturer operating as separate firms in the same area.[11] In a linkage relationship of this sort the degree to which the starter factory's employment would be affected by a rise or decline in employment and output on the part of the automobile manufacturer would be a function of the portion of total starter output absorbed by the local car manufacturer. A consistently more direct variety of linkage is that found at major ports where separate terminal, warehousing, special financing, and insurance firms operate on a highly integrated basis with shipping companies and railway systems.

Apparently one of the things that is required to make the concept of linkage sufficiently broad so that it will encompass the internal characteristics of ratio element change is an extension of the term to include complementary relationships and joint demand patterns as well as direct linkings.

Complementary relationships and joint demands within B might be broadly exemplified by the ties between the apparel industry and the fashion center that New York represents, by plants manufacturing scientific equipment and scientific consulting firms and university libraries, by tire manufacturing plants and gasoline refineries in the same base area. In the latter instance it is assumed that a national or broad regional change in the demand for gasoline might eventually affect production and employment in the durable goods tire industry. Complementary interaction of this variety cannot, of course, be taken for granted. The nature of the change in demand for gasoline must be fully understood. If a decline in gasoline sales from the local refinery is the result of competition or impairment of supply probably tire manufacture will not be influenced. However, if the decline in sales is traceable to falling consumer incomes on a national or regional basis tire manufacture will be affected. The region is mentioned in this connection only on the assumption that it may be an important part of the tire manufacturer's market.

As might be anticipated complementary relations of firms are far more common in S than in B. Sales of automobiles by local dealers would have a strong influence over automobile acessory store sales, sales of groceries over meat store and produce market sales, and so on. This situation lends further perspective to an understanding of the characteristic of complementary chain reaction in sales volume and employment that may be expected within S when a change in B occurs. Undoubtedly, independent quantitative and qualitative changes in S in both the short and long run can also be traced to complementary relationships.

Another variation which is not to be considered definitely part of either of the above categories is the so-called "sub-basic." The sub-basic activity is well exemplified in the university town or the long-term tourist community where on-the-spot consumption of a basic service (education or tourist amenities) takes place which involves long-term consumption from many personal service establishments. These establishments by virtue of sales to outsiders become associated with the originating or dominant base. There is no doubt that a special sort of linking or complementing exists between a university student body in its seasonal and secular variance and the economic activity of the restaurants, rooming houses, drug stores, taverns, clothing stores, and numerous other personal service firms within a community which are dependent on the student's patron-

[11] The starter plant would, according to criteria outlined in previous articles, be considered a part of B.

age. It is, perhaps, immaterial as to whether or not the distinction mentioned is a sharp one. The important thing for the planner is to identify, measure, and analyze a relationship of this kind in his community in order that he can better gauge the potential economic chain reactions that are likely to develop.

In the case of linked and some types of complementary industries there exists the problem of determining when their arrival in a base area may be expected. This problem has, apparently, an easier solution in the case of linked activities. The possibility of an industrial link, particularly manufacturing, entering an urban area grows as the size of particular local basic firms increases. When local basic firms have reached a size which would make a linked industry an economic possibility the planner can either count on their early arrival or suggest to citizen groups the promotion of their entry. From a technical point of view it is advisable for the planner to identify those industries of his community which are likely to attract links and to determine the general size range that may eventually encourage link entry. It is not to be assumed that size of the resident base industry is the only factor determining link entry. Naturally questions of raw materials, markets, local public service facilities, and the like are also involved.

There is a strong likelihood that as the link relationships of an urban base area become longer the economic sensitivity of these chains and hence of the entire area to changes in the dominant base firm at the head of the chain will become greater.

Parasitic base industries are akin in ratio dynamics theory to the linked, complementary, and sub-basic activities just discussed. The classic example of the parasite activity is the silk industry which follows the mining industry in order to take advantage of the cheap labor available from the wives and children of the miners. The association of parasites to their "host" base and TP is unique in that the existence of supplementary income from the parasite may, with a decline in B, postpone out-migration and therefore maintain TP in stage two for a longer period. Furthermore, the mining portion of B may exercise a more flexible production policy if it is sure of having its labor force held in the area, at least for short periods, by the sustaining income from the parasite. However, prolonged shutdowns or reduced work weeks in the mines could force large-scale outmigration that would eventually reduce the labor pool available to the parasite to such an extent that it also would leave the community and thus reduce the base even further. On the other hand, the initial entry of a parasite into a community, while it may stimulate S in the regular manner and increase TP by attracting families to the area through the appeal of supplementary income and new jobs in S, may have some negative effects in the host base. If, for example, the host base is not strongly unionized it may reduce wages on the arrival of the parasite and thus negate somewhat stimulation to S and TP.

Another aspect of internal ratio element dynamics which requires extensive theoretical development is that which relates to the possible effects on the economic community of competition of firms within B or within S. If there are within a community two shoe manufacturing plants which are in competition for one or all of the factors of production, raw materials, transport services, or markets what are the implications for employment in the community of success of one plant and failure of the other in the competition? Clearly, there is an economic re-

lation here which it is extremely vital for the planner to recognize. It cannot be assumed that the employment loss stemming from the failure or cut-back of one shoe plant will be taken up by the other. Similarly, declines in local plant purchases of merchandise and services and payments by the plant of property taxes cannot with any surety be counterbalanced by the increased activity of the other plant. In fact certain elements of local monopoly may enter in whereby the remaining plant might demand property tax concessions and enforce wage rate reductions. However, if the two shoe firms were in hot competition under joint demand for a scarce supply of local labor it is likely that aggregate wage payments within the community would rise. This situation would stimulate the growth of S. The variety of competition described here is of the direct kind. Undoubtedly, somewhat similar conditions might evolve within either B or S if competition by substitution were in process. Whereas this variety of competition is more frequent within S it occurs within B as well. No doubt the difficulties of an analysis of this type of competition within S would be far too great for the planner unless a few very large firms or activities were involved. However, within B the analysis would be more manageable. Rail and truck-bus competition would be a case in point here, particularly in those cases where railroad employment classifiable as basic was of good initial size within the community. Frozen food preparation versus the standard canning process could also serve to demonstrate the case of competition through substitution within B. For the planner the question remains, will a change in one of these constituents of B affect other portions of the element?

In communities in which the economic base is one-seasonal, as it often is in tourist areas, or in which the base is seasonally balanced, the planner may be faced with problems of dynamics different from those discussed thus far.[12] For example, a community which has a seasonally balanced base may experience chain reactions within B if one portion declines or increases. If, as is frequently the case, a common labor force is employed by both portions of the seasonally balanced base a decline in the sales volume and employment of one may affect the other negatively. This can come about as a result of the fact that portions of the common labor force may be forced to migrate in order to locate a full year's employment. If the reduction of the labor force is sufficiently great the other seasonal activity might be forced below a point of profitable production volume and consider moving from the community.[13] Increases in employment in one of the two seasonal activities can bring about a sympathetic reaction in the other. This may also occur as a result of changes in the supply of labor. Increases in force available to one seasonal unit of the base are likely to be available to the other. Enlargement of the local labor pool may enable the second seasonal unit to depress its wages sufficiently far so that it can lower its commodity or service unit price to the point that production expansion of considerable size would be warranted. This production expansion might then initiate independent demands for outside labor on the part of the second seasonal base unit.

In the situation where the community base has a single season, introduction of an off-season base activity can

[12] A seasonally balanced base is one composed of at least two export activities which have their production and employment concentrated at roughly opposite portions of the year. These activities may or may not be in a single firm.

[13] The remaining seasonal activity may increase wages to hold its force. While this will reduce out-migrations it will also reduce profits and hence the desirability of continuing in business.

have an influence over the original single season activity. This occurs along lines similar to those described in the previous paragraph. An increase in local employment opportunities particularly on a balanced basis may attract more labor to the area. This situation might enable the original single season activity to cut wages, increase profits, and ultimately expand activity either within the firm or by additions of firms. The same effect might develop simply from the fact that the employees of the single-season industry would consent to wage reductions because they could be more than compensated for their loss in off-season employment.

Number of base enterprises found in a community has only a peripheral relation to the question of internal base ratio element reactions here under discussion. It is perhaps obvious that the one firm or industry community will experience relatively few of the conditions of internal change thus far described. However, as the number of firms and industrial variety of B and of S increases within a community it is only logical to expect more complex patterns and prolonged periods of internal interaction.

Linkage and complementary industry relations within an urban area raise the question of economic interdependence and the geographic level at which it becomes significant. Vining has made the point that interdependence is of greatest significance on the regional level.[14] He questions, therefore, the degree to which the urban economic structure can in itself be termed interdependent. The thesis thus far pursued in the present series of papers argues for a very close economic dependence of S on B within an urban area and apparently a greater dependence of B on S than has ordinarily considered to be the case. In an industry-by-industry approach, firms within a particular base probably do have a greater degree of interdependence regionally than within the base area. Nonetheless, when the linking pattern of a particular base has begun to assume great complexity it appears reasonable to believe that the degree of purely local interdependence is accelerating.

Input-Output Technique

An extremely important concept which has a direct relation to the problems of urban base ratio dynamics is the input-output technique. This technique operates on the assumption stressed in the dynamics discussion that there is within an economic area, in this case urban, a close inter-relationship among its economic activities. The technique as developed by Leontief and applied to metropolitan areas by Isard and others further maintains that the interrelations of activities are measurable in terms of dollar input and output.[15] Input-output tables with the same listing of industries in the columns as in the stub show not only the static condition of an urban economy but also the potential of change that will occur through all other industries of the area with an inciting or initial change in one export activity. Production data of this type are, of course, convertible into more usable employment figures.

One outstanding virtue of the technique is that it can also show interindustry-interregional competitive and complementary patterns which are so vital to the planner in judging external

[14] Rutledge Vining, "The Region as an Economic Entity and Certain Variations to be Observed in the Study of Systems of Regions," *American Economic Review*, Papers and Proceedings of the American Economic Association, May 1949, p. 93.

[15] Wassily Leontief, *The Structure of the American Economy, 1919-39* (New York: Oxford University Press, 1951); and Walter Isard, "Interregional and Regional Input-Output Analysis: A Model of a Space Economy," "*The Review of Economics and Statistics*, November 1951, pp. 318-28.

influences bearing on the economy of his area.

Objections to the technique point out the general absence of data in the form required and the complexity of working with such data when they are available. These are, it is hoped, only temporary obstacles to wider use of the method by planners. In the opinion of this writer the input-output technique provides the best current means for not only working out a more complete theory of urban dynamics but also ultimately testing the postulates of the theory.

There is in some quarters the mistaken idea that input-output has replaced or is competing with the base-service interpretation of the urban economy. At present, Professor Walter Isard, the main exponent of input-output in its urban application, maintains that he is simply trying to make it possible ". . . . to discard the crude rule-of-thumb procedures used by many social scientists in attempting to anticipate changes in the economic base and growth potentialities of urban areas."[16] He continues in the application of the technique to refer to export (base) industry. However, he greatly refines the measurement-description of the service activities of the community in terms of "expansions," first, second, third round, and so on. In short, it may be said that input-output provides a very promising measuring device that has particular value in the field of urban economy dynamics and hence in the field of planning estimates and controls.

[16] Isard, Kavesh, and Kuenne, *op. cit.*, p. 317.

Conclusion

It has been the intent of this paper and the one preceding it to outline the broad nature of base ratio dynamics in order that the city planner and urban land research specialist can better comprehend both the importance and the perspective of this aspect of the economic base concept. As can be judged from the discussion, urban dynamics theory is still very much in the formative stage and sorely needs further intensive thought and work at conceptual and empirical levels. It is hoped that this article may play a small part in stimulating further effort in those directions.

Reports and Comments

Reliability of the Yearly Deed Sample of Land Prices and Transfers†

Introduction

WARRANTY deed data represent one of the major sources of information for land market studies. Most land market studies which are based on warranty deeds use complete enumerations of all bona fide farm transfers that occur during the period under study. Using complete enumerations of warranty deeds, however, necessitates a relatively detailed time-consuming approach. As a result, the timeliness of the information gathered frequently must be compromised with the extent of the area covered. In order to lessen the time and effort involved in conducting land marketing studies based on warranty deeds, investigations have been undertaken to determine the reliability of sampling as a possible alternative to complete enumerations. Sampling studies to date have been restricted to developing and testing sampling techniques for two significant characteristics of the land market. They are (1) average price of land per acre and (2) number of farm transfers. Of the several sampling possibilities investigated, the yearly sample based on the first fifteen days of each month during the year has shown the most promise in terms of reliability and feasibility.[1] Before recommending the yearly fifteen-day sample as a reliable approach, further tests have been conducted to determine more definitely its advantages and disadvantages.[2] This article presents the tests undertaken and their results. As such, comparisons are made between samples and non-samples (complete enumerations). Two major comparisons including minor sub-comparisons are presented. The major comparisons include (1) a comparison of the sample price and transfer estimates with the non-sample prices and transfers, and (2) an investigation of whether the date of the instrument makes any appreciable difference between sample estimates and non-sample data.

Statistical tests of significance for the sample estimates of land prices per acre and number of transfers were not undertaken since the fullfillment of the assumption for a random procedure was not followed. Such a procedure would not have permitted the simplified sampling technique desired.

† Project 449-A, Oklahoma Agricultural Experiment Station. Grateful appreciation is extended to Professors Carl E. Marshall and Franklin Graybill of the Statistical Laboratory of Oklahoma A. and M. College and Professors L. F. Miller and L. A. Parcher of the Department of Agricultural Economics, Oklahoma A. and M. College, for their interest and suggestions.

[1] Tests on the reliability of sampling techniques in estimating average land prices per acre and volume of transfers indicated a favorable showing for a yearly sample based on the first fifteen days of each month. Eighty-six percent of the prices per acre and 93 percent of the transfers in the yearly sample were included within a 90 to 110 percent range of the yearly non-sample market. If only per-acre land price estimates were desired, a semi-annual fifteen-day sample might be satisfactory. The non-sample market consisted of average land prices per acre and volume of transfers as determined by a complete enumeration of all bona fide transfers for every business day of the month during the vear. In the previous study the "complete enumerations" were referred to as "non-samples." See Robert L. Tontz, Jeppe Kristensen, *and* C. Curtis Cable, Jr., "Reliability of Deed Samples as Indicators of Land Market Activity," this *Journal*, February 1954, pp. 44-51.

[2] Results for the first fifteen days rather than the first fifteen business days were inadvertently presented in Table I of the article, "Reliability of Deed Samples as Indicators of Land Market Activity," this *Journal*, February, 1954, p. 49. The sample days for a fifteen-day sample included the first fifteen days of each month of the year after Sundays and national holidays had been eliminated. A yearly sample (1954) based on the first fifteen days of the month includes 33 fewer sample days in a year than one based on fifteen consecutive business days which includes 180 days. Actually there was little difference between the yearly sample based on the first fifteen days and the yearly sample based on the first fifteen business days. For example, the first twenty-day sample which included 202 sample days as compared with 147 for the first fifteen-day rated higher on prices but lower on transfers in the 90-110 percent range of the non-sample market.

Source and Scope

The data used as a basis for this study included the following eight counties and years:

Choctaw	1941-1952
Delaware	1952
Garfield	1952
Grady	1941-1952
Jackson	1941-1952
Latimer	1952
Payne	1941-1952
Texas	1949-1952

All of the counties are located in Oklahoma.

The warranty deeds used were restricted to what were considered to be bona fide transfers. Among the transfers eliminated from the bona fide grouping were settlements of estates, sheriff's sales, foreclosures, and transfers between relatives in which the consideration was questionable. In many instances the decision as to the bona fide nature of a transfer was a matter of personal judgment of the enumerator.

If the total consideration was not recorded on the deed, it was estimated from the amount of federal internal revenue stamps indicated on the deed. A range in value of $500 was allowed for each 55 cents in federal stamps. If the consideration had to be determined by this method, the mid-point—except for the first $500 of the $500 range—was selected. The range in value for each 55-cent increase in federal stamps is as follows:

Federal Stamps (Cents)	*Range of Consideration* (Dollars)	*Estimated Consideration* (Dollars)
55	101–500	300
110	501–1,000	750
165	1,001–1,500	1,250
220	1,501–2,000	1,750
275	2,001–2,500	2,250

Unless otherwise stated the transfers were divided on yearly bases, using the date of recording the transfer in preference to the date of sale, because of the greater ease of enumerating the data.[3] Transfers of less than 10 acres were not used.

Yearly Samples and Non-Samples

Tests concerning the reliability of the fifteen-day sample estimate of average land prices per acre and number of transfers have been made by comparisons of fifteen-day and greater than fifteen-day samples with non-samples. All of the samples covered a yearly time period. The fifteen-day sample was based on the first fifteen-days of each month of the year. The greater than fifteen-day samples were based on the first twenty and first twenty-five days respectively of each month of the year. The non-samples included all bona fide transfers that occurred during each month of the year.

Ability to Estimate Non-Sample Estimates

Comparisons of the sample estimates of land prices and number of transfers were made within three ranges of the non-sample data. The first range was from 99 to 101 percent of the non-sample prices and transfers. The second was from 95 to 105 percent; the third was from 90 to 110 percent.

The first range was chosen to determine the number of sample estimates that were approximately the same as the non-sample figures. A difference of plus or minus 1 percent would be relatively negligible and yet allow for minor differences due to rounding off figures.

The second range, 95 to 105 percent, was selected as an intermediate standard to indicate the extent of sample findings either 5 percent above or below the non-sample figures. Without knowing the non-sample figures, however, there was no means of determining whether the sample finding was above or below the non-sample figure, or how far below it may have fallen, if it was in the designated range. The probability of a sample figure falling in the 95 to 105 percent range of the non-sample figure was determined by the frequency of sample figures in the non-sample range. If the sample figure

[3] For sampling this becomes obvious with a clear understanding of the method of filing instruments and the procedure used to obtain the data. The instruments are filed in the books of the county records in the order of the time of their reception by the county clerk or deputy. Therefore, all instruments of similar types (deeds, mortgages, or leases) which are recorded on the same day are adjacent. It is thus possible that two instruments which were executed (sold) on the same day but recorded on different days may be and often are separated by as many as several hundred pages in the county records. The enumerator, in securing deed data, searches or "thumbs through" the deed records until he finds a bona fide transfer of farm land. If the date of recording is the criterion setting the limits which the sample is to cover, the enumerator merely has to search the instruments which were filed in the first fifteen days of each month which are in consecutive order. If, however, the date of sale is the criterion, the enumerator must search through every instrument in the record book, and, if such is the case, the saving in time brought about by utilization of the sample would be extremely small.

was in the 95 to 105 percent range of the non-sample, the sample may have been either 5 percent above or below the non-sample figure or any figure in between these limits. Thus, the sample figure was in a range equal to plus or minus 5 percent of the non-sample figure.

The 90-to-110-percent range was used to complete the description of the results of the sample periods. In terms of usual measuring standards a range of plus or minus 10 percent (10 percent above and 10 percent below the non-sample market) appeared to be lacking in precision. If the sample figure fell in a 90-to-110-percent range of the non-sample market, the sample figures may actually have been either 10 percent above or 10 percent below the non-sample figures, or any figure in between. This allowed for a range in price, which, with one exception, exceeded the largest yearly percentage change in the index of Oklahoma land values since 1912.

If the sample period were not characterized by enough cases in this wide range of 90 to 110 percent of the non-sample figures, the reliability of sample data would be seriously questioned. In effect, if a sample did not have approximately 70 percent of its cases in this broad range of 90 to 110 percent of the non-sample market, it would be very doubtful as a suitable indicator of actual market developments, because of the extreme latitude allowed.

None of the samples was satisfactory in estimating the non-sample prices and transfers within the 99-101 percent range. The twenty-five day sample, which was the highest, had only 21 percent of its prices and 43 percent of its transfers within 99-101 percent of the non-sample estimates. (Table I).

TABLE I—Frequency and Percentage Distribution of Land Prices Per Acre and Transfers in Selected Yearly Sample Periods for Designated Ranges of the Yearly Non-Sample Market.

Range of Yearly Market	Item	Yearly Sample Period by Days of Month			Yearly Non-Sample Period
Percent		*First Fifteen*	*First Twenty* Frequency (Number)	*First Twenty-Five*	*All days of Month*
99–101	Prices	2	2	3	14
	Transfers	1	5	6	14
95–105	Prices	11	11	11	14
	Transfers	6	10	11	14
90–110	Prices	12	13	13	14
	Transfers	13	12	13	14
			Percentage Distribution*		
99–101	Prices	14	14	21	100
	Transfers	7	36	43	100
95–105	Prices	79	79	79	100
	Transfers	43	71	79	100
90–110	Prices	86	93	93	100
	Transfers	93	86	93	100

* To compute the percentage distribution of a sample period the number in the frequency should be divided by 14, the total number of yearly samples. The transfer percentages indicate the comparative rank with the non-sample assuming a continuation of the same number of transfers for the remainder of the month as occurred during the sampling period of the month.

Within the second range, which included 95-105 percent of the non-sample data, the twenty-five day sample had 79 percent of its prices and 79 percent of its transfers included. The twenty-day sample had 79 percent of its prices and 71 percent of its transfers within the 95-105 percent range. Although the fifteen-day sample rated as well as the twenty-five day sample in estimating prices, it fell far short in estimating transfers. Only 43 percent of its transfers were within 95-105 percent of the non-sample data.

The third comparison, which included a 90-110 percent range of the non-sample data, showed that the fifteen-day sample was approximately as good as the longer twenty-day sample. The fifteen-day sample had 86 percent of its prices and 93 percent of its transfers within 90 to 110 percent of the non-sample data. The twenty-day sample had 93 percent of its prices and 86 percent of its transfers within 90-110 percent of the non-sample data. The twenty-five day sample rated the highest, with 93 percent of its prices and 93 percent of its transfers within 90-110 percent of the non-sample data.

Extreme Estimates

Another procedure which was used to give an indication of the reliability of the fifteen-day and greater than fifteen-day samples was to determine how much the most extreme estimates of prices or transfers differed from the non-sample figures.

The fifteen-day sample estimate of prices ranged from 18 percent below to 13 percent above the non-sample data. The fifteen-day sample estimate of transfers ranged from 20 percent below to 8 percent above the non-sample estimates.

The twenty-day sample had a narrower range for prices than the fifteen-day sample. Price estimates for the twenty-day sample ranged from 9 percent below to 13 percent above the non-sample data. The twenty-day sample estimate of transfers ranged from 16 percent below to 7 percent above the non-sample data.

The range in the twenty-five day sample estimate of prices was not appreciably different from that of the fifteen-day. Price estimates for the twenty-five day sample ranged from 14 percent below to 10 percent above the non-sample data. It will be recalled that the fifteen-day sample had price estimates which ranged from 18 percent below to 13 percent above the non-sample figures. For transfer estimates, the twenty-five day sample estimates ranged from 14 percent below to 4 percent above the non-sample. The fifteen-day sample estimates ranged from 20 percent below to 8 percent above the non-sample.

While the ranges in the extreme price estimates and transfers appeared to be large for the fifteen-day sample, this condition characterized the twenty-five day sample also.

Directional Changes

A further comparison consisted of determining the number of times sample estimate of prices per acre and number of transfers followed changes in non-sample data.

The fifteen and twenty-five day sample estimates of prices and transfers followed the non-sample estimates 100 percent of the time. The twenty-day sample followed the non-sample price and transfer estimates 93 percent of the time.

Date of Instrument

For ease of enumeration, the yearly fifteen-day sample was based on the date of recording the instrument rather than the date of sale. Since the sample was based on the date of recording, the question may be asked whether it was then simply a sample of the transfers which were recorded within the specified period rather than a sample of transactions actually occurring within the period. If the results of sampling were greatly different from complete enumerations based on date of recording, the sampling error would be magnified by the difference, if any, between complete enumerations based on (1) date of recording and (2) date of sale.

Percentage Differences

In order to provide more definite information on this question, comparisons were undertaken for Payne and Grady counties, 1946-1948, to determine whether the sample estimates of prices and transfers based on date of recording were greatly different from complete enumeration data on prices and transfers based on (1) date of recording and (2) date of sale. Estimates on number of transfers for the yearly fifteen-day sample were converted to yearly bases to be comparable with the yearly complete enumerations.

In order to determine whether the sample based on date of recording was a sample of

transactions which were recorded within the specified period rather than a sample of transactions actually occurring within the period, comparisons were first made between the complete enumerations based on date of sale and complete enumerations based on date of recording. Actually there was little difference for prices. The greatest difference occurred in 1948 for Payne county. The price based on complete enumeration date of sale averaged $37.52. For the complete enumeration based on date of recording the instrument, the price averaged $36.40; this was a difference of only $1.12 or 3 percent below the price determined from the complete enumeration based on date of sale.

Estimates for a yearly fifteen-day sample based on date of recording showed that average prices ranged from 4.2 percent below to 10.1 percent above the average prices computed from complete enumerations based on date of sale.

As compared with price averages computed from complete enumerations based on date of recording, the sample price estimates based on date of recording ranged from 4.7 percent below to 7.4 percent above.

For transfers, percentage differences ranging from 8.8 percent below to 8.7 percent above characterized the results (number of transfers) determined from complete enumerations based on date of recording as compared with complete enumerations based on date of sale. Sample estimates of transfers based on date of recording ranged from 5.0 percent below to 9.8 percent above the complete enumeration estimates based on date of sale. As compared with the complete enumeration computation of transfers based on date of recording, the sample estimates based on date of recording ranged from 5.1 percent below to 8.1 percent above.

Frequency Comparisons

An additional comparison of (1) sample enumerations based on date of recording and (2) complete enumerations based on date of recording and date of sale was undertaken by summarizing the frequency of prices and transfers within three designated ranges of a complete enumeration standard. The comparisons were based upon data for Payne and Grady counties, 1946-1948. The first range was from 99-101 percent of the complete enumeration standard. The second was 95-105 percent; the third was 90-110 percent. The standards were represented by complete enumerations in all instances. For sample I the standard represented a complete enumeration based on date of recording the instrument. For sample II the standard included a complete enumeration based on date of sale. The standard for the complete enumeration based on date of recording was the complete enumeration based on date of sale.

The samples did not have any price or transfer estimates within the 99-101 percent range. The complete enumeration based on date of recording had no more than 33 percent of its prices and transfers within 99-101 percent of the price averages and transfers determined from complete enumerations based on date of sale.

In the second range (95-105 percent), 100 percent of the average prices computed from complete enumerations based on date of recording were included within 95-105 percent of the average prices determined from complete enumerations based on date of sale. From 33 to 100 percent of the sample price estimates were included within 95-105 percent of the complete numerations.

The samples were approximately as satisfactory as the complete enumerations on transfers within the 95-105 percent range of the complete enumerations. The frequencies were low, however, averaging from 50 to 67 percent for the two counties.

In the third range (90-110 percent), the complete enumeration based on date of recording had 100 percent of its prices and transfers within 90-110 percent of the prices and transfers calculated from complete enumerations based on date of sale. One sample estimate of prices and transfers included as few as 67 percent of its prices for one county; however, 100 percent of its transfers were included within 90-110 percent of the complete enumerations based on date of sale. On the average, 83 percent of the sample price estimates were included within 90-110 percent of the complete enumeration average based on date of sale. Measured by the complete enumeration standard based on

date of recording, 100 percent of the sample estimates of prices and transfers were included within the 90-110 percent range.

Conclusions

In choosing a standard from which to measure performance, the problem of correctly deciding on a norm arises. In land market studies expressed in averages of prices per acre and totals of transfers, this task is complicated by the fact that land is sold in highly dispersed, poorly organized markets as compared with the products produced from land. Another complication is the fact that the "complete enumerations" do not include all of the transfers. Instead, only those transfers which have federal stamps attached or which show the consideration are available for analysis in the "complete enumerations." Furthermore, the complete enumerations do not always include transactions reported in the proper time period. Since many land market contracts are not recorded in the county courthouses, the ultimate issuance of warranty deeds may reflect land prices and volume activity for some past period. Accordingly, deeds resulting from land contracts must be eliminated to obtain accurate complete enumerations for current periods.

Inasmuch as average land prices are not only based on highly diverse units but are affected also by judgment of what constitutes a bona fide sale, it appears that undue reliance should not be placed upon average land prices and total number of transfers resulting from so-called "complete enumerations" as indicators of land market activity. A more realistic view appears to be the acceptance of a standard which has a reasonable range of tolerance. Such a standard should take into consideration the varied characteristics of land as well as make allowance for the possible un-like ways in which bona fide sales might be selected.

With this in mind, indications are that a range of 90 to 110 percent of the non-sample market would appear to be as tolerant a range as should be selected. This range approximately equals the highest yearly percentage change in the index of land values for any single year in Oklahoma during 1912-1953.

The first fifteen-day yearly sample was approximately as reliable as longer samples (twenty-day) within the 90-110 percent range of non-sample prices and transfers and as such appeared to be a reliable indicator of land prices and transfers. In the event this range was deemed too wide and a narrower range of 95-105 percent was chosen, it is doubtful that sampling should be undertaken, because of the low reliability of the fifteen-day sample on transfers. The twenty and twenty-five day samples would not result in an appreciable saving of time and money as compared with a complete enumeration; therefore these samples would be unacceptable despite their relatively satisfactory performance in estimating prices and transfers.

Although the ranges in the extreme price estimates and transfers appeared to be large for the fifteen-day sample, this condition also characterized the greater-than-fifteen-day samples. Since the twenty-five day sample did not have an appreciably greater number of extreme price and transfer estimates than the fifteen-day sample, indications are that a fifteen-day sample would be about as satisfactory as a greater than fifteen-day sample in terms of accuracy.

Although the designated ranges of the non-sample land prices and transfers appeared large, the sample estimates of land prices per acre and number of transfers closely followed the non-sample directional changes. The fifteen-day sample estimates of prices and transfers, for example, compared very favorably with greater than fifteen-day samples as well as with the non-samples. The fifteen-day price and transfer estimates showed increases and decreases in accordance with the non-samples 100 percent of the time.

Since there was little difference between land prices determined from complete enumerations based on date of recording as compared with land prices computed from complete enumerations based on date of sale, the possibility of magnifying the sampling error by basing the sample on the date of recording the instrument would likely be small.

Even though no appreciable differences in prices or transfers were found resulting from date of recording and date of sale of instrument, it is possible that these differences may

be more significant in other states than in the Oklahoma counties studied. In those instances wherein "earnest-money" down payments take the form of short-term land contracts some months may elapse between date of sale and date of recording the instrument.

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The Non-Residential Population of the Central Business District*

MANY basic temporal and spatial patterns of the human community are revealed in daily routine population movement to the central business district. Moreover, due to the relative ease with which it may be reached, the general tempo of activity in the center is consistently as high as is found at any point in the community. A study of movement into and out of the downtown area, therefore, affords a valid basis for a description of some of the essential relationships which exist among the various units of the modern city.

The following discussion presents an analysis of the non-residential population in the central business district of Flint, Michigan, at any time during a typical twenty-four-hour period in 1950. There is no attempt here to promote Flint as the "average" American city. The specific findings, therefore, are not assumed to be applicable to all large United States communities. It is hoped, however, that this study will add to the growing body of urban research which, in total, will permit general patterns or relationships to be isolated from those peculiar to a given community.

The Methodological Basis of the Research

Following a plan developed by the United States Bureau of Public Roads, an origin-destination traffic survey was undertaken in Flint by the Michigan State Highway Department in the spring and summer of 1950. Origin-destination surveys of this type involve two distinct studies which, in combination, provide data for the entire community. Information about the movement of residents of the city was obtained through home interviews with persons chosen by the application of strict probability methods of sample selection. Non-residents of the city were interviewed in their cars when they crossed a cordon line set up around the Flint area. Detailed descriptions of the operations entailed in this project are available elsewhere.[1]

The Central Business District Population Throughout an Average Weekday

The Flint central business district includes approximately thirty blocks in the heart of the city. As in most cities, land values and building height in the Flint downtown area decline continuously and rapidly with distance from the center. The central business district of Flint is probably smaller than is usual for a city of more than 150,000 residents. A large part of the failure of the district to expand at a pace equal to that of the total community may be attributed to the rapid and recent growth of Flint, and to the fact that the city is not a major regional center.

Number and Residence of Central Business District Commuters. During an average weekday almost 12 percent of the 327,000 persons[2] who live within eighteen miles of the Flint central business district enter the center (Table I).

TABLE I—NUMBER OF COMMUTERS TO THE FLINT CENTRAL BUSINESS DISTRICT PER 1,000 PERSONS LIVING WITHIN AN EIGHTEEN-MILE RADIUS BY PERIOD PRESENT IN THE DISTRICT

Period Present in the District	*Commuting Rate Per 1,000 Population*	*Number of Commuters*
All hours	115	37,740
Midnight–2:59 A. M.	3	981
6:00–5:59 A. M.	1	443
3:00–8:59 A. M.	19	6,136
9:00–11:59 A. M.	46	14,898
Noon–2:59 P. M.	55	17,917
3:00–5:59 P. M.	51	16,637
6:00–8:59 P. M.	28	9,030
9:00–11:59 P. M.	15	4,990

* This paper is selected and condensed from the author's, *The Non-Residential Population of the Central Business District of Flint, Michigan; A Study in Human Ecology* (Ann Arbor: Social Science Research Project, 1954).

[1] Michigan State Highway Department, *Metropolitan Area Traffic Study Manual* (Lansing: Planning and Traffic Division. Michigan State Highway Department, 1946).

[2] Base date for this report is the summer of 1950.

Data not shown here indicate that the likelihood of commuting varies by distance of residence. About 17 percent of the residents of the area located within two miles of the district commute daily to the center. This proportion decreases steadily until only 5 percent of the people living twelve to eighteen miles away engage in such movement every twenty-four hours.

A recent study, using traffic survey data, concluded that smaller cities (those with populations from 100,000 to 250,000) have much higher commuting rates than do larger metropolises.[3] In addition, this research found that for cities in the size class of Flint there is an average of 250 central business district trips for every 1,000 community residents. The under-development, in this respect, of the Flint downtown area is apparent in that even for the area located within a two-mile radius of the center there are only about 176 trips to the district for every 1,000 residents.

Purpose of Trip. An especially interesting feature of the origin-destination traffic survey data available to this report is that they allow a description of the purposes of central business district trips. As seen in Table II, three out of every ten trips to the district over a twenty-four hour period are for the purpose of shopping. This is the strongest single reason which brings persons into the center. The second most important purpose, numerically, is that of work. One-fourth of the commuters in the center during an average weekday are working there. It may be noted that while shoppers outnumber workers when all hours of the day are combined, at no hour of the twenty-four are more shoppers in the district than are workers. Apparently, this is due to the longer durations of stay in the downtown area for workers as compared to shoppers.

TABLE II—THE NON-RESIDENTIAL POPULATION OF THE FLINT CENTRAL BUSINESS DISTRICT BY PURPOSE OF TRIP AND PERIOD PRESENT IN THE DISTRICT

Period Present in the District	Purpose of Trip					
	Work	Shop	Social-Recreational	Transact Business	Other Purposes	Total
All hours	25%	31	17	12	15	100%
Midnight–2:59 A.M.	59%	....	28	13		100%
3:00–5:59 A.M.	85%	....	15			100%
6:00–8:59 A.M.	77%	23				100%
9:00–11:59 A.M.	47%	29	....	10	14	100%
Noon–2:59 P.M.	41%	30	8	12	9	100%
3:00–5:59 P.M.	44%	29	9	10	8	100%
6:00–8:59 P.M.	27%	14	40	19		100%
9:00–11:59 P.M.	24%	....	54	22		100%

The central business district is also a major recreational and social center. About 17 percent of the non-residents in the district during the twenty-four-hour period are there for this reason. Working, shopping, and seeking recreation account for almost three-quarters of all daily commuters. As is seen in the following section of this paper, fluctuations in the tempos of these three activities furnish the basic patterns which shape the temporal structure of the center of the community.

[3] Donald L. Foley, "Daily Movement of Population into Central Business Districts," *American Sociological Review*, October 1952, pp. 538-543. See also, Harland Bartholomew, *Urban Land Uses*, Harvard City Planning Studies, IV (Cambridge: Harvard University Press, 1932), pp. 71-84.

In addition to the above, about one out of every ten persons downtown during an average weekday is there to transact business. Unlike social-recreational movement, however, almost all of the business trips occur at approximately the peak tempos of the working and shopping rhythms; thus, the relative importance of business trips at any given period of the day is smaller than the absolute number of such trips would otherwise indicate.

The Changing Composition of the Central Business District Population Throughout an Average Weekday

The tempo of activity in the central business district experiences vast changes throughout the twenty-four hours of the average weekday. The comparative stillness of the early morning is soon transformed into the seemingly frantic tempo of mid-day. This, in turn, subsides into the leisurely but still active pace of evening. The pattern is repeated again throughout the next twenty-four hours. The following section describes some of these fluctuations as they occur in the Flint downtown area.

Less than one-half of 1 percent of those persons who live within an eighteen-mile radius of the Flint central business district are in the downtown area part or all of the period from midnight to 2:59 A.M. (Table I). The temporal structure of the center at this time is highly influenced by work movement, and, to a considerably smaller degree, by movement of a social-recreational nature (Table II). Thus, out of every ten early morning commuters, six are working and three are seeking recreation.

The general tempo of activity in the central business district attains its lowest intensity between 3:00 and 5:59 A.M. During these hours one-tenth of 1 percent of the residents of an eighteen mile ring around the center are in the area. Understandably, the relative importance of work movement increases from midnight to 5:59 A.M. In fact, before six in the morning, more than eight-tenths of the total non-residential population are central business district workers. At no other time in the daily round is one type of movement so predominant in shaping the temporal structure of the center.

A major surge of activity occurs during the first hours of the normal working day. From 6:00 to 8:59 A.M. about 19 commuters per 1,000 residents of the area located within eighteen miles are in the district. Three hours previously the rate is only 1 per 1,000. During this period, as earlier, the great majority of commuters are working, although the relative importance of work declines from the high of the previous three hours.

The total number of non-residents in the community center part or all of the 9:00 to 11:59 A.M. period more than doubles the number in the area before nine in the morning. At this time, 46 out of every 1,000 persons who reside within eighteen miles are in the center. The relative number of workers continues to decline as the day grows older; thus, during the pre-noon hours the temporal structure of the central business district is influenced by several forces. The major purpose which brings persons downtown, however, remains that of work. But by now the movements of shoppers and, to a lesser degree, persons in the area for business reasons are playing important secondary roles.

The tempo of activity in the center reaches its greatest intensity from noon to 2:59 P.M. It is during this period that the peaks of the separate rhythms of shopping, working, and transacting business tend to converge. Even now, however, less than 6 percent of the residents of the city and suburban areas are in the Flint central business district. This figure is decidedly less than the average for cities of similar size. In general, the relative importance of the three major reasons for entering the downtown area during the day remains approximately constant throughout the period from 9:00 A.M. to 2:59 P.M. But even in the early afternoon almost one out of every ten commuters in the center is seeking recreation.

Most of the post-noon trends described above carry over into the 3:00 to 5:59 P.M. period; also, there is only a slight decrease in the number of non-residents after three in the afternoon. Thus, there is a comparatively stable relationship among the several purposes which generate recurrent movement to the center from nine o'clock in the morning until about five o'clock in the evening. Of every ten persons downtown at some time during these hours, four to five are engaged in work, three are shopping, one is transacting business, and the remaining one or two are in the area for other reasons.

The tempo of activity declines approximately 50 percent during the late afternoon

and early evening. Nonetheless, the number of non-residents in the center is about one-half again larger from 6:00 to 8:59 P.M. than it is at the start of the work day. As the evening approaches, shopping and working become less important while social-recreational movement develops into a major influence. In fact, it is only between the hours of 6:00 P.M. and midnight that workers do not account for the largest proportion of all commuters. From 6:00 to 8:59 P.M. about four out of every ten persons downtown are seeking recreation; less than three out of every ten are working.

The number of central business district commuters continues to decline throughout the evening. During the last three hours of the day only about 1.5 percent of the residents of an eighteen-mile radius are engaged in recurrent movement to the center. At this time, well over one-half of the commuters are seeking recreation. Only work movement (with about one-quarter of the total) approaches the social-recreational rhythm in importance by this late evening period.

Summary

Urban research has tended to emphasize the spatial relationships which are found in the city, to the relative neglect of the temporal structure of the community. As is shown above, there are vast changes in the composition of the downtown population throughout a twenty-four hour period which are themselves worthy of investigation. The data used in this research were collected by means of an origin-destination traffic survey administered by the Michigan State Highway Department. Several surveys of this type have been done throughout the country. Where possible, economists, human ecologists, geographers and other social scientists should investigate the possibility of utilizing these high quality data in their own academic research.

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Study of Land Problems of the Middle East

The third regional meeting on land problems to be held by the Food and Agriculture Organization of the United Nations since the World Conference held at the University of Wisconsin in the fall of 1951 is currently under way in Iraq during this fall of 1955. The first, on Latin American problems, was held in Brazil in April 1953. The second, on land problems in Southeast Asia, was held in Bangkok, Thailand in November 1954.

The conference is sponsored by the government of Iraq, the International Cooperation Administration (foreign aid agency of the United States Government) and the Food and Agriculture Organization of the United Nations.

The meetings, like those of the World Conference at Madison, combine sessions of high-level agricultural officials with a special training course for young professional workers from the participating countries. Fifteen countries, including Afghanistan, Egypt, Ethiopia, India, Iran, Iraq, Jordan, Lebanon, Libya, Pakistan, Saudi Arabia, Sudan, Syria, Turkey, and Yemen have been invited to send students to the training course. Twenty of the participants in the training course will be selected to come to Wisconsin for a year of intensive study. The University of Wisconsin expects to offer a special program of graduate study on land problems in economic and social development during 1956-57 as a follow-up to these Middle East meetings.

Instruction at the conference will concentrate upon land settlement and land reform programs of the Middle Eastern countries, land tenure policies, land utilization problems and other questions of land use that affect economic development. Preparatory work for the conference and training course has been under way for more than a year. The responsibility of F.A.O. for the conference is being carried by Rainer Schickele and Thomas Carroll.

* * * * *

The Faculty and the Alumni Association of the Graduate School of Design of Harvard University announce a Conference on Urban Design and the role of Planners, Architects and Landscape Architects in the design and development of cities, on April 9 and 10, 1956. Lectures, seminars, exhibition, and discussions will be held in Robinson Hall and Hunt Hall at the University. Further announcements on arrangements will be made available by Dean Jose Sert of the Harvard Graduate School of Design.

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